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Mental Health of the Preschool Child*

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ABOUT half of the hospital beds in the United States are utilized by victims of mental and nervous diseases. It has been estimated that approximately 4½ per cent of the total population of the United States will, some day, be in a hospital for mental diseases. The State of New York sustains an economic loss of $130,000,000 annually as a result of mental disease.

Without tabulating the numbers of mental defectives, epileptics, neurotics, and psychotics, it is patent that the mental health of a community should play a definite part in any public health program although, up to the present, it has received comparatively little attention from public health officials or in the AMERICAN JOURNAL OF PUBLIC HEALTH.

For too many years health has been regarded as a term relating only to physical well-being. In its broad connotation, however, health is more than a state of optimum activity of the physical organization of man. It is rather a state of well-being that enables him to live most and best and to realize his functional potentials. Mental health is part of the unity of life and it involves a consideration of the welfare of people in terms of their satisfactions, their services, and their human relationships.

Mental health at all periods of life represents the healthful operation of mind. It encompasses the subjective side of life. Mere existence is valueless; consciousness of existence determines whether or not life is worth while. Preschool age children are as much concerned with their own subjective reactions as any other members of the community, even though they may not possess an understanding of their own potentials or realize the meaning of social adaptation. Whatever is to be done in the realm of preventing mental disease, whether by public enactment or private efforts, it is obvious that infancy and early childhood afford the richest opportunities for constructive service.

The public health movement is concerned primarily with the field of prevention. In so far as various diseases play a part in diminishing the mental health of children, the psychiatrist is in harmony with all efforts to diminish those diseases which lower the physical vigor of the communities and undermine the mental stability of their citizenry.

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No therapeutist would deny the tremendous mental factor existent in treating various patients suffering from tuberculosis, syphilis or orthopedic deficiencies. No one could gainsay that all public health efforts to control tuberculosis and syphilis, rachitis, diphtheria, poliomyelitis, and other diseases in infancy, safeguard mental activity as well as physical soundness. Everyone will concede the physical and psychical significance involved in the prevention, palliation, and cure of sensory and motor handicaps, whether strabismus, epispadias, or webbed fingers; whether an intra-uterine amputation, a congenital cataract, or an ophthalmia neonatorum. Body and mind—there is mind in body and body in mind. The mental health of the preschool child, therefore, involves at every level the preservation of his physical well-being, as a primary factor in establishing the potentials of normal psychical living.

The preschool child occupies a temporal position between infancy and school attendance. But the line on either side delimiting his status is not sharply drawn. His mental health involves the events preceding the age of 2 years and the shadow of the events which are to occur at the age of 5 or 6 years. The psychic well-being of the preschool age child is bound up in such problems as are concerned with the prenatal care, maternal mortality, rational spacing of pregnancies, adequate obstetric attention, and a lessened use of forceps, especially among primipara. Convulsions and mental retardations involve work, not merely with cripples, but with immense problems of psychic rehabilitation in order to secure a reasonable adjustment to our rapidly moving life. It is obvious that mental health is not a thing completely apart from physical well-being. The child with a brachial paralysis, a hemiplegia, or a traumatic strabismus, is a sufferer *in toto* as well as *in loco*. The treatment of the injury is a thing apart from the treatment of the injured, and both are interwoven with mental hygiene.

The fact of birth itself is a psychophysical factor, in so far as it subjects the child to physical strains and cerebral pressures, and it may occur in a psychological atmosphere which may be disadvantageous from many angles. The death of a mother in childbirth alters the status of the potential mental life of the child. The maintenance of family life or the presentation of an adequate substitute, therefore, plays a part in fostering mental health. I am not interested at this particular moment in discussing the very important familial limitation of offspring with reference to the mental health of children. But it is fair to remark that many of the mental maladjustments of preschool age children arise from their psychological reactions at being unwanted, neglected, or abused for reasons not understood by themselves, but which play a part in the emotional atmosphere of the home into which they have been born. Some children are actually penalized by their own birth, and they react with forms of aggressive behavior not dissimilar in kind to those exhibited by their noisy elders when thoroughly conscious of their own rejection.

It is manifest that an intelligent home and an educated parenthood offer far better background for the development of mental health than a home of ignorance, brutality, instability, and disorganization. Frequently tantrums, enuresis, night terrors, somnambulism, excessive lachrymation, restlessness, irritability, whining, and sulkiness are symptomatic of home activities or inactivities out of harmony with rational child training.

The preschool age is of the utmost significance because it is the period of life when the main mechanisms evolve which are concerned with human de-

velopment. It is the period of neurological life during which myelinization occurs, permitting the organization of new associations, the limitation and direction of capacities, the acquisition of experience, and the development of character trends. Mental deficiencies become more evident and their management by medicaments or education calls for diagnostic judgment and therapeutic guidance. The early detection of potential school retardates, institutional types and economic ineffectives, enables society to provide the intelligent care and resourceful training that advances the mental health of the children and protects the later social welfare of the community.

Primarily the preschool age is one of personality expansion, or, one might even say, the period of personality cohesion. Consider the evolution of locomotion, speech, manual activity, emotional experience, and social intercourse, and their mutual interactions as well as their interplay in the personality in the making. All of these developmental functions play a part in laying the fundamentals of mental health of the preschool child.

First, in order of importance, I should lay stress upon the age of habit formation. There enters into mental health the factor of habituation whether to one's own visceral activities, to one's own ego, or to social life about him. Hence mental health is manifest in the development of adequate and acceptable habits with reference to food, to the excretions, to sleep, and to the genital areas. If one thinks of anorexia nervosa, enuresis, pavor nocturnus, and masturbation, one immediately senses a disturbance of psychic equilibrium. Such habit reactions give evidence of incomplete adjustments to life. Underlying difficulties may inhere in faulty training by parents, in an action of revenge, or in a response to a feeling of fear, or to some insecurity arising from parental, mainly maternal, indifference or ignorance. The development, therefore, of intelligent parenthood with reference to basic habits possesses fundamental values. Public health functions best through education. Knowledge concerning correct habits and the hazards of somatic irregularities is more useful socially than information concerning vitamins, or poliomyelitis, sera, or the treatment of chronic arthritis. The prevention of a phobia, a revenge motive, a sense of personal inadequacy, may lessen the future prevalence of neuroses, psychoses, delinquency, and crime.

The preschool age should be regarded from its developmental angle. I need but call attention to the variety of experiences which play a part in the evolution of personality. The development of locomotive stability, the necessity for visceral balance, the significance of nutritional equilibrium with an adequate amount of vitamins and minerals in the dietary, the growth of endocrine harmony, the natural development of hand preference, the active immunization against infections, protection against traumatisms, all play a part in safeguarding not merely limbs and viscera but in determining the mode of life which the child is to enjoy and to which he is to react. The originally left-handed child who is forced during this period to become right-handed later may evidence his disability in stuttering and may find himself further penalized psychically by an increasing speech difficulty and his growing fear of his own limitation. Thyroid and pituitary disturbances manifesting their influences upon body growth and mental activity may become the basis of incapacities subversive of normal mental function. The public health representatives have unusual opportunity for locating preschool age children with developmental difficulties and in inaugurating a program for their welfare.

While I have mentioned both habit formation and developmental difficulties from the mental standpoint, this preschool era of psychic reaction is of transcendent importance. This is the age of developing speech, of interchanging ideas, of testing out one's universe, of experimenting with the environment, of exercising the pioneer trait of curiosity and seeking satisfaction from and for it. This is a period during which, to a large extent, the interests of the child and the adult are not identical because their worlds are not identical. It is the age for the child to discover his own ego and to find himself as an individual—a person and an individuality—working in a world dominated for the most part by creatures of a larger growth. These, including parents, relatives, and other well wishers, desire to guide him and bring into his life the "musts" and "don'ts" that are so often in conflict with his desires and purposes. From the combination arises an assortment of conflicts, some light, some heavy, some superficial, some deep, some conscious, and some finding their habitat in subconsciousness. They may emerge as tantrums, cruelty, tics or hysteric behavior, maladjustment, exaggerated activities, and neurotic reactions.

Fundamentally, however, mental health is not a matter of anatomy, nor is it primarily a matter of intellectual endowment. It is rather one of reactivity and reaction to a universe in terms of feeling. I shall omit reference to hereditary traits in neuropathic, defective, and originally diseased families. and consequent mentally dysgenic familial pressures, save to note that the locating of such families is a reasonable public health function in the interest of a program to foster the mental health of a growing generation.

The preschool age affords an abundant opportunity for the evolution of emotional trends. In self-occupation, in efforts to secure independence, in contactual experience with brothers and sisters, parents, nurses, and the world at large, the child finds the agreeable and disagreeable. It is not necessarily a pleasure and pain alternative, but nonetheless there is a definite unfolding of some basic emotional mechanisms. His personality has to depend in a large measure upon the fundamental bonds of his primitive emotional life. Phylogenetically, emotional and reflex action antedate intellectual and purposeful activity. If one considers merely such reactions as appear during fear, he appreciates that the over-development of fears during this period of life leads to a contraction of the ego. While rage may lead to ego expansion and aggressive activity, the inculcation of fears and the temporary experience of incipient states of terror rob personality of its security and diminish the stability of the self. Fear devastates the spirit within and may show comparatively few effects to those round about; rage may dissipate its energy upon those round about and leave but a small trace of its damage upon the being within. Fear is more directed at one's own self, while rage expends itself more upon others. Love and hatred as positives and negatives, find themselves bound up with fear and rage in determining the nature and extent of mental health during this early period of personality formation.

The emotional unfoldings together with the conscious recognition of one's own capacity to evidence emotions, combined with reactions to the emotions of those about one, involve social experiences of all kinds.

Preschool life involves almost the maximum contact of parents and siblings. Most of it grows out of the home itself although much is found in the interactivities of recreational life. There enter likewise the beginnings of self-selection of friends and playmates, the sensing of likes and dislikes, the

attitudes toward games and sports, the selection of interests and occupations. In addition, special contacts occur with doctors and nurses, public health workers, social workers, teachers in nursery schools, as well as parents, grandparents, relatives, boarders, friends, visitors, and workers about the home.

Vaccination, immunization, an enema, irrigation of the ears, colic, a blister, a tonsillectomy are physical events with subjective values but they are less important that what happens to the child under conditions of discomfort and distress. The fact is equally true for rewards and punishments at all ages. No contact is devoid of experiential value. No experience can be wholly negative in character. Whatever happens is a stimulus to which the child must respond. He is conditioned by the world into which he is received, as well as by the parents who have passed on to him certain hereditary determinants. His life, therefore, is dynamic. He is essentially labile; and inactivity during this age places him upon a vegetative rather than upon an animalistic level. He lacks the independence of the young animal but he has the advantage of associative memory, multiple choice, and a capacity for changing interests and enthusiasms. His mental health involves constant adjustment and adaptation. He is continuously testing his power and worth in terms of his limited but increasing ability to cope with life. His home is an island which gives him reasonable security, but he would cross the strait and start an adventure on the main land of life.

Much of what the school child is to be depends upon these early interactions. How far is maternal overprotection to harass him, lessen his confidence, and sap his psychic independence? To what extent are false parental attitudes to hamper his natural development? To what extent is he to be merely an instrument for parental pleasure, parental satisfaction, or for parental expiation? To what extent is he to be in competition, always compared with someone else to make him feel his limitation, his inadequacies, his inferiorities? To what extent is he to be penalized by a lack of opportunity, by vicious patterns, by cruelty, by personal abuse, and by witnessing marital infelicities? To what extent is he to be the victim of misunderstanding and repression? To what extent is he to be the victim of parental fears, disappointments, and vicissitudes? Is he to be merely a toy, an outlet for parental emotions, a comfort and solace, a satisfying but spoiled object of manifold solicitude? How far indeed is he to be regarded as a person rather than a thing, an organic being rather than an object in the house? Such questions are vital in considering his responses, his habits of mind and thought, and his behavior reactions. They are to affect his character, his health and his happiness.

Mental health involves the cultivation of a few fundamental principles and practices. Personality as a unit consists of the interaction of numerous trends. The estimation of what constitutes mental health is a matter of social opinion. Majority opinion constitutes normality. The norm of mental health involves a reasonably broad band of activities which do not pass beyond those vague limits which are held to be the beginning of behavior detrimental to others. These standards vary in communities, and even within communities according to accepted levels of behavior of families. Lying would be regarded by one family as an evidence of mental ill health and by another as natural, normal, and expected. In one group stealing would represent a fearful and fear instilling state of mental disease, whereas in another it would be deemed part of

experience, reasonably common and without a hint of mental deterioration.

Strangely, most forms of behavior which are aggressive in character and represent a profound effort to grapple with life's situations are held to be more pernicious than the tendencies to sit apart, to be quiet, self-amusing and hesitant, if not absolutely shy with others. A balance between extravert and introvert trends obviously is more advantageous than an extreme expression of either one of these personality trends. The experience of child guidance clinics amply illustrates that parents regard as evidence of ill health those characteristics which, for the most part, interfere with parental comfort and the generally desired peace standards of the household.

Every form of behavior must be regarded as purely symptomatic, as representing the activity of the total biologic social organism. One should not consider the mental health of the preschool child with a segregated reference to his physical well-being, or his intellectual potentials or his emotional trends or his social relations. It is the totality of these which enters into his thinking and doing, into his reactions toward what he wishes and what he wills to do, as well as into his positive or negative attitudes toward the desires and demands of those round about him.

One sees very little of epilepsy, and still less of psychoses among preschool children. Mental deficiencies vary in degree at this age, whether they are congenital, acquired as a result of birth traumata, or due to the dwarfing or warping of the personality during this primary period of development. The emotional conflicts and struggles which are incidental to youthful experience are part of the trial and error experiment that is determining capacity to adjust to both success and failure in life. This is a period of adjustment not for school life but for all life. In it are laid those foundations whose values will be determined while grappling with the intellectual life of schools and experiencing the emotional life of adolescent love affairs, as well as in revealing their capabilities for adult adaptation. Mental health, therefore, calls for primary consideration, not in terms of psychoses, even though some of the seeds of psychotic conditions may be planted during these early years, but in terms of constructive factors that integrate the personality.

The preschool child who is allowed to cultivate his independence, who is encouraged in attention, persistence and coördination; who is aided in the establishment of habits of order and regularity in function; who is given an opportunity to play and to share with other children; who is given a variety of helpful parental patterns; has the finest opportunity for building up normality in mental health to the time of school entrance.

The preschool child must not be regarded as an isolated individual. His mental health is a continuum, probably extending from the moment of conception until the time of physical dissolution. A single age period has been set off arbitrarily as representing the period of the preschool age. One merely glimpses at this period of 4 years and finds that it is a period of rapid change. It is an age during which his physical growth is not marked by great increases in height or weight. Between the ages of 2 and 6 years he gains little more size or pounds than between the date of birth and two years but his psychic growth, rapidly advancing, is transcendent in importance.

During the 6 years prior to school entrance the child learns more, acquires greater power, develops more mechanisms, and brings into harmony more strains of his personality than he will ever again organize in a similar period of time. Even bearing in mind the

tremendous new drives and emotional advances that are related to the development of the gonadal system during adolescence, one can safely say that the preschool period is the fundamental time for promoting mental health. It is a period of latent sexual pressures but is not without sexual influence in experiences. It is the natural age for establishing right habits of action and of reaction; for promoting social friendliness with a full consciousness of one's own personality; and for fostering a sense of values in terms of adaptability and adjustment.

Preschool life affords ample bases for achievement, for meeting success and failure, for cultivating independence, for learning leadership, for promoting initiative, and for finding that wholesome balance between aggressiveness and submission which characterizes social adequacy. These are factors in, as well as functions of, mental health, whose foundations are to be laid in the preschool age before the social instrument of education with heavy hand endeavors to mould the plastic resourceful child to a single pattern of nonresistant, obedient, conforming childhood.

Public health officers can accomplish much by broadening their concept of health, by enlarging the scope of their protective and preventive activities so as to include within their dynamic functions the enrichment of life. This would be far more consequential to mankind than merely extending the expectation of life. To live is more than to exist and mental health is more than physical well-being.

Paper-Reading and Discussion

. . . The fact is, when people get to a certain age—not so great an age, either—they do not go anywhere to listen: they go to be critical and to talk: not to hear of the experiences of others, but to tell their own. For the young and the enthusiastic this is rather pitiful. It is so very hard to learn that the real secret of writing papers is not putting things in, but leaving things out. . . . The time occupied in impressing the extent of the erudition of the audience upon the audience should never on any account exceed 20 minutes at the very outside. Only the smallest amount of ground should be covered, and the minimum number of ideas uncovered. Of these, only a few should be discussed at any length. To an audience the most attractive contents of a paper are those read into it by the audience. A set lecture is an entirely different thing, of course. The audience here is either prepared to concentrate for an hour or ready to endure boredom for that period. Speaking generally, a society meeting is no occasion for a lecture. A 20-minutes talk is what is wanted: unless, of course, one is a named contributor to a symposium, when 10 minutes should be the utmost limit.—*Pub. Health,* Jan., 1933, p. 130.

Are the "Nerves" and Badness of Childhood of Any Importance to the Field of Public Health?*

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THERE are two reasons why I hesitate to use the phrase "mental health of childhood" before a group of physicians: First, the term mental health seems to make a distinction between health of mind and health of body; whereas in the reality of practice we cannot divide a human being into mind and body. We deal with health problems of individual child and adult as a total unit. Second, the term mental health is apt to carry commonly only one association—the intellectual development of child and adult, and this is a matter which public health physicians and doctors in general consider the business of departments of education. Suppose we discuss these two issues for a moment, and then pass on to some concrete examples of poor child health in the form of nerves and badness which the school child exhibits.

Health is an expression of the human being in action. While theoretically we may discuss the functioning of individual physiological systems of the body, we are quite aware that they do not exist in majestic isolation. The gastrointestinal system, for example, is so intimately associated with the cellular activity of the body as a whole that we cannot talk about digestion and metabolism and excretion except in their relation to the total functioning of the organism. In like manner the structure and organization of the nervous system must be taken into consideration as much by the specialist in circulatory conditions, as the functioning of the circulation must ever be kept in mind by the neurologist. In short, a human being functions as an exquisitely integrated organism, every cell of which is dependent upon the behavior of every other cell. We know very little about the intricacies of these relationships.

In spite of the great advances in specific tests of a chemical, biological, and psychological nature, the reaction of the individual to the tests of life is still very much of a mystery. Why some people remain thin and others fat, some are bright and others stupid, some phlegmatic and others alert, in spite of heroic attempts at modification, are matters that intrigue us now as much as ever. We know that the constitutional endowment of a human being—intellectual, biological, temperamental—is a very definite and rather unmodifiable matter to deal with.

Only the youthful enthusiast wastes much energy in arguing whether it is environment *or* endowment that is *the* determinant of mental and physical activity. The rest of us prefer to adopt the more constructive approach of trying to find out what kind of environment and developmental assistance

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offers any given constitutional endowment its best chance of development. This is certainly the goal of preventive medicine, which has acquired a wealth of knowledge concerning the antecedents of malnutrition, bone deformities, heart disease, tuberculosis, and predatory bacterial enemies that lie in wait for childhood all along its journey. One has only to travel in other countries and see the toothlessness of young men and women to be consumed with admiration for the great work achieved in our own country in spreading the gospel of oral health alone.

It is because of the great results achieved by an intelligent campaign against the forces disorganizing biological growth and development that I am so eager to have preventive medicine include in its plans an equally concerted program against that seriously increasing menace of our national health—nerves. Nerves constitute a kind of poor health that we as physicians pay little attention to until it reaches the stage of hospitalization. Again and again we hear without concern statistics gathered from reliable sources which tell us that "nerves" called "neuroses" and "psychoneuroses" constitute at least 50 per cent of cases coming to the specialist and general practitioner; that there are more patients in public and private psychiatric hospitals in this country than are found in beds occupied by patients suffering from all other disorders put together. Why have we ears but fail to hear the prophetic warning embodied in such statements? The reason is not complex. We are afraid of the whole topic of "nerves" because we do not know about this field.

Back in medical school the anatomy and histology of the nervous system is usually presented like a dose of catechism. With this bad taste of first and second year in his mouth, the third and fourth year student approaches his clinical neurology with the profound hope that he may pass the course if he can memorize the last chapters of Osler's System in a more or less ritualistic manner.

Those who took part in training medical officers for service in the neuropsychiatric division of the A. E. F. were amazed at the ignorance shown by the average candidate with regard to making the simplest kind of neurological examination. And if such a condition exists concerning the fundamental principles of nervous system organization and structure, how great is the gloom when the physician is called to consider the psychological aspect of "nerves." A dash of endocrinology, and focal infection theories, with a sprinkling of Jung and Freud completes the salad of words and not facts.

Nerves increasing under the pressure of our high powered civilization are being passed for treatment from the hands of pediatrician, general practitioner, and public health officer, to the jurisdiction of cults and sects and behavioristic academicians with the word "clinical" in front of their names. Now, there is nothing about the subject of nerves too deep for the grasp of any earnest and honest seeker after light. It is not necessary to read all the literature poured out on this field of health. If we wish to become intelligently aware of a few essential principles in other fields of medical science, we find time to take postgraduate work here and there, and to get a list of a few good books on the subject. The physician who works with children in private practice or in school health organizations has the greatest of all libraries and laboratories at his disposal—the schoolroom—if only he is interested enough to use it. Here is the place where one can see the nerves of the coming generation developing.

"Nerves" are in every instance a reaction to strain of one sort or another,

and their treatment must be directed toward modifying this strain. The symptoms of nerves in the school child cover a wide range of complaints many of which take us into the realm of what is ordinarily called conduct. Whenever a child annoys or disturbs his environment we think of his activity as conduct to be judged instead of behavior to be interpreted, and consequently focus our attention on trying to stop the conduct instead of trying to find out why he acts as he does. For example, here is a cross-section of complaints studied last year by a health officer in two of our Baltimore junior high schools. They are symptoms of strain manifested in 79 students of both sexes—

Easy tearfulness

Nervous stomach with occasional nausea and vomiting during school hours

Headache and dizzy spells

Impudence to teachers

Refusal to do homework

Irritability and grouchiness when criticized

Falling asleep in school

Laziness, inattentiveness, chronic truancy

Child complains of funny feelings in the head and says she cannot think.

Spells of saying queer things in school which she claims she does not remember afterwards

Child is unable to concentrate, flies off at the least thing, steals from her mother, is boy crazy.

Fits and screaming spells

This pupil is sullen and dull, has done well in school up to this year but now refuses to work.

Katie seems to be in a daze, goes to lavatory frequently, seems to have undue influence over younger classmates.

John is hopelessly slow in school, and does not follow directions.

May trembles and cries when called on in class, and says she feels sick all over.

Jane complains of weakness in her stomach and throat and has attacks of flushing in which she gasps for breath and says she is dying.

William has spent 4 terms in the 7th grade, now stays by himself a great deal to avoid teasing, is aggressively defiant towards teachers, is suspected of stealing but denies it with tears.

Here are complaints familiar to every teacher from kindergarten on, but she usually does not mention them to the school physician because he is not interested in them. Moreover, if the physician examined such a child and found no physical defect, he would in all probability be as puzzled as the teacher.

The first step in studying the nature of the strain responsible for such symptomatology is to find out as much as possible about the stuff of which the child is made—intellectual, biological, temperamental. Fortunately psychology has put at our disposal in the group and individual intelligence tests and in educational tests a means of finding whether a child is adequately fitting the grade to which he is assigned. Discrepancy between intellectual ability and school programs and home expectations is one of the commonest sources of child nerves. A child who is forced to cope with a course of study beyond his ability will do one of two things, depending upon his temperament. If he is phlegmatic and easy-going he will quietly evade issues, play truant, hold up signing of report cards, and not infrequency drift into delinquency which is much more entertaining than the schoolroom. If he is sensitive, conscientious, timid, he will fret and worry over his failures to measure up, and not infrequently develop headache, nausea, fatigue, etc., as unwitting body protests against life as he is called upon to face it.

What can the school doctor do about situations like this? They are, to be sure, the job of departments of education. At least he can be so aware of the situation that he can place the facts of the strain frankly before teachers and parents that something may be done to lower standards and let up on the nagging. In large city schools intelligence tests are routine in the first grade, but frequently they are not repeated for several years on the supposition that the intelligence rating of early child-

hood will go on to adolescence. In rural schools there is frequently no intelligence testing, the teacher deciding in her own right whether a child can or cannot do his work. Then again there is the custom of promoting on trial, or advising summer school for children who have failed their grade. Too often this forcing is not so much the fault of the school as of parents who insist on son or daughter being promoted to satisfy family pride. The easing up of strain on such children may come through transfer to special class or opportunity class, or transfer to vocational or pre-vocational school. Or, if no such relief is available in a school system, removal of the child from school at the earliest possible moment the law allows with recommendation for work permit is far better for his mental health than continuance year after year in an environment saturated with failure and discouragement. In the 79 school misfits referred to it was found that the "nerves" of two-thirds of the group represented the strain of intellectual inability to meet school demands.

In studying the nature of a child's biological endowment the physician has many tests of science at his disposal, and yet perhaps his most valuable ally is a careful and painstaking study of empirical facts gathered from following groups of children on through adolescence. The best illustration of this fact is to be found in the data coming from the White House Conference on Child Health and Protection. When this body, consisting of 1,000 experts in every sphere of child welfare, pooled their findings after a year or two of work, one was surprised to realize the difficulty they had in agreeing upon such an apparently simple thing as what constitutes a state of nutrition.

We crave some quick and concrete method of standardization, especially in the biological field. As a matter of fact the more thoroughly we go into that sphere, the greater individual variation appears, and the more complex becomes cellular relationships. We know from experience that certain types of structural organization stand strains of life poorly, and yet we cannot determine why. Childhood organizations, prone to tics and easy vomiting and asthma and eczema and persistent enuresis and night terrors and stammering, is human material that cannot put up a sturdy fight against handicaps of severe physical illness or intellectual strain, or a wealth of excitements and poor social conditions that another kind of constitutional endowment would not notice.

Pediatrics is studying these children with reference to finding means of desensitizing them when they are found to react to any one protein. It is an excellent point of approach provided that as physicians we also study ways and means of desensitizing these children to environmental situations that upset their emotional equilibrium. In such patients we almost invariably have restless, over-conscientious, often timid and extremely sensitive temperaments. We cannot make them over, but by recognizing their problems in early school years we can help them to learn to live with themselves better in years to come, and undoubtedly reduce their chances of being nervous breakdown liabilities.

Children with such neuropathic constitutions react poorly to speed tests, and competitive struggles of athletics or academic work with prizes and awards. Many of them are intellectually precocious, and find themselves the pride and joy of teachers who are eager to have them do extra work and skip a grade, or to add summer school to a school year that has already proved exhausting, or to push them into public speaking and school plays. The child himself shrinks from these things, but

goes on with the plans because he wants to please teachers and parents. It is impossible for the layman to distinguish between child reluctance born of a constitutionally unstable nervous endowment, and that associated with laziness or adolescent rebellion against life in general.

Such problems do not come to the school physician for decision until the child, bending beneath the strain of over stimulation, develops multiple tics, or functional choreiform movements, or stammering. Then the medical prescription is usually to take him out of school and make him rest as much as possible. What the child needs is not withdrawal from school, but easing up of the school load. Taking such a one out of school breaks up habit routine upon which he thrives, and focuses his attention upon himself as a weakling and nervous invalid—a concept that may stay with him all his life.

Another serious nervous handicap belonging in this group is stammering. Stammering may begin with the onset of speech in the preschool child, and in 9 cases out of 10 will disappear in a short time if the environment completely ignores the matter. It may begin suddenly in the school child or adolescent following a fright or other serious emotional upset, or it may come on gradually under a period of strain at home or in school. Often this type of stammering is accompanied by jerking and twitching and respiratory tics. Stammering is a condition that is usually treated with speech training by the department of special education. The objective of speech training is to teach the child a technic of coördination between breathing and articulation. The stammering child needs something more. He needs an understanding of the sources of strain from which his stammering arises, and he needs help in learning to manage his emotional life. Hand in hand with technics of coördination must go a knowledge of this individual child and his home and school setting.

I have mentioned some of the general sources of nerves in the school child that pass unnoticed because of their frequent occurrence. To teacher and parents they are of interest chiefly because of their annoyance. To the physician they should be of interest because they are harbingers of poor health that he and his colleagues will be treating long after the school period is over. The child and adolescent well started in habits of nervous instability are as seriously handicapped for self support, and family formation, and wholesome civic relationships as if they were suffering from handicaps with lesional pathology.

We have in our educational and child welfare organizations the set-up for giving every school child the benefit of an all-round study of health conditions that affect him, but we cannot do this properly until there is more coördination between departments of health and departments of education. The doctor needs to have an intimate knowledge of the problems of the schoolroom, and the teacher needs to have a larger concept of health education than is now hers, and both doctor and teacher need more knowledge of the homes from which school children come.

Parent-teacher association is doing a good work, but it does not reach the individual child. Last winter when speaking at a Parent-Teacher Association meeting the principal said to me,

> The mothers who need health talks most are not here tonight. We can never get them to take part in our meetings. We teachers have not time to visit them, and they never come to visit the school except to complain about something.

One cannot expect our over-worked school nurses to get social data in their hurried visits. Here is the function of the visiting teacher—to acquaint school

with home and home with school. Years ago when teachers boarded around and there were family doctors, the community was acquainted. Today under the complexities of modern living all is changed to a status of mass production in health, in education, in social relationships. We cannot change these conditions, but we can work out some coördinated plan by virtue of which health problems of the individual child are not lost sight of in our ministration to the group.

The children handicapped by motor disability, defective vision, hearing, speech, and intellectual retardation are the educational problem of departments of special education in which psychologists and teachers expert in the pedagogy of specific handicaps plan and work with them. Except for examination of the specific physical disability, the school doctor has no contact with these children so far as interest and inquiry into the way they are adjusting themselves to these limitations is concerned. He could learn a great deal if he knew them better.

The futile struggle to adapt one's self to a world cut off by the elimination of a special sense organ, or the ability to achieve locomotion, reacts on the personality of the handicapped in a great variety of ways, depending on his temperament—whether he is ingrowing or out-going—and upon the opportunities which environment offers for self-expression. A wholesome start in the childhood of these human beings determines the trend of their entire lives.

The teacher cannot do it all. She needs the interest and intelligent helpfulness of the physician who has a concept of health that is not limited to the technics associated with his particular specialty. Public health cannot afford to ignore the behavioristic aspects of its field of service. The burden of its neglected opportunities falls back inevitably upon nation, state, city, and rural community in the form of chronic dependence, state hospitalization, organizations for dependent and neglected childhood, penal and correctional institutions; yet schools of public health and hygiene have practically no place for the study of mental hygiene in their curricula.

As lay and professional people we have always been keenly interested in the welfare of children, but our interest has been more or less desultory and uncoördinated. It has been an interest more philanthropic and religious, than an interest associated with any scientific inquiry into the nature and needs of childhood. The dependent and semi-dependent child we have thought of as needing food, shelter, and clothing, and a certain amount of "schooling," but we have paid comparatively little attention to the best interests of these children as individual boys and girls.

Year by year medicine and education, and the behavioristic sciences of psychology and psychiatry have been driving home to us the fact that the mental, physical, and social health of the adult life of every community must begin with an intelligent and constructive interest in the story of the individual child.

Child-caring organizations are drawing away from the institution as a unit of ministration to the dependent child, and declaring themselves in favor of the boarding and foster home. The family is after all the basic factor of community life, and the child who does not grow up with the consciousness of being a part of a family group misses something that institutional life cannot supply. Hence modern social science is spending a great deal of time, money, and thought in keeping families and homes intact, and in trying to study the social, economic, and health forces which tend to undermine the stability of the home. Here are matters that come within the

province of family case work organizations and probation departments of courts and other institutions and agencies dealing with domestic relations.

In spite of all these efforts there are hundreds and hundreds of children in every city and state who cannot live in their own homes, and consequently must be planned for elsewhere. The means of support behind these children represent a great variety of sources. There are the City Charities, the Jewish, Catholic, Lutheran, Methodist, and Episcopal organizations; private nonsectarian institutions; and agencies receiving some financial support from the city and state in addition to their own endowments. But the variation in financial support and budgets available for boarding care is as nothing compared with the variation in methods of study and follow-up work on individual children and types of institutional care and boarding and foster home placements.

The mental health of childhood has been grossly neglected in the past. We have thought of it only as conduct to be judged, not as behavior to be understood and treated. We expected every child to be able to follow school programs arranged for average children, and when he did not we concluded that it was because he was lazy or insubordinate. Psychology and education have discovered that at least 25 per cent of school children are intellectually unable to follow grade work planned for the average child, and 30 per cent of children are able to go faster than the average child.

The mental health of childhood includes more than the intellectual ability of the child. In includes his temperament, or disposition, and the habits he forms from infancy on in learning to manage his anger, fears, discontents, jealousies, and tantrums. These habits of management and control are dependent upon many things besides the child's willingness to behave or misbehave. While children vary in their ability to manage their dispositions, they are dependent to even a greater degree upon the example which fathers and mothers and other grown-ups in their environment set before them. The homes in which children live are more important than the schools to which they go. Here is the place where the child learns ways and means of getting along with other people, habits of honesty, a sense of justice, respect for religious institutions, and the observance of law. In other words, the seeds of good or bad citizenship are sown within the environment where boys and girls spend the greater part of their growing life. The neglected, dependent, or semi-dependent child needs nurture and training along these lines just as he needs food, clothes, and educational facilities. Unless child care of institution and foster home and boarding home take these matters into consideration they are fulfilling only a small part of their obligation to the development of childhood. Training along such lines cannot be accomplished in a mechanical manner. It calls for some attention to the constitutional endowment and make-up of the individual child. It is a retail not a wholesale proposition.

The Child Welfare League of America has made a considerable study of organizations and agencies in city and rural districts of this country dealing with child care, and has pointed out that the 23 members of this group differ greatly in the attention they pay to a study of the individual child cared for. Some of these organizations make no effort to give a child a thorough physical examination, except to ascertain that he is not a carrier of contagious disease. Others make no attempt to inquire into his intellectual fitness to get on in school grading. They pick him up out of a wretched home environment and drop him into another environment

without any inquiry into whether he will fit this environment, or this new environment will fit him. We would not transplant cabbages on the eve of their maturity in such an unintelligent manner. Other agencies which make a better study of the child before placement have not the money or the personnel of workers that would enable them to follow the child from year to year after he has been placed. The reclaiming of swamps and the reforesting of waste areas of land are not undertaken in such a haphazard manner, because we know the economic consequences of a job done so poorly. But the reclaiming of neglected childhood is apparently not undertaken with half as much seriousness. We are too shortsighted to see the economic waste, and as laymen we are often too sentimental to appreciate the value of a scientifically trained common sense in an approach to the growth and developmental problems of childhood. In other words our program of child welfare needs uniformity in its standards of work.

Our agencies and institutions work side by side in honest public spirited endeavor to give childhood a good start on its journey of life. But we do not all see things alike; we have diversified policies of management; boards of managers are either too busy to take time to see where policies are leading, or else they are traditional rather than thoughtful in their thinking. There is nothing in the technics of modern science that is in the least contrary to any religious denominational belief or inimical to the real interests of the taxpayer. The best thought in public health, social service, and education is at the disposal of the city and state if they wish to avail themselves of this helpfulness. The set-up of education, health, social agencies is already existent. The need is for a unanimity of social consciousness concerning community needs of child welfare among us.

I look forward to the time when we can have municipal and state bureaus of child welfare under the leadership of personnels who know our problems, understand the make-up of our community constitution, and for whose training and common sense we have respect. It is only in a centralization of interests that we can adequately minister to child needs among us, and unify our efforts in a constructive piece of work.

Australian and New Zealand Butters

INVESTIGATIONS prove the high and uniform vitamin potency of Australian and New Zealand butters. The content of both vitamins A and D is as high as butters produced in Great Britain or elsewhere in Europe, even when compared with summer butters and those from cows fed on a fortified diet. The racial origin of the cow has no significant effect upon the vitamin content, and butters from different parts of Australia are closely equivalent in value. There is no appreciable loss of vitamin potency during the transit by sea, and in a number of cases, no notable loss could be detected after storage, even up to 2 years. This was true of butters stored in large or small quantities, and prepared from sweet or acid cream.—Abstract from *Special Report Series, No. 175,* Medical Research Council, 1932, pp. 46–47.

Mental Hygiene of Adolescence*

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THE subject upon which I am asked to speak does not necessarily serve to confine me to the limits that would ordinarily be indicated by the title of my paper. When I was asked to talk to you on the subject of the Mental Hygiene of Adolescence certain things suggested themselves to me which I conceive to be of importance and those are the matters which I shall discuss.

In the first place, I think I state a generally recognized truth when I say that adolescence is a period of especial stress. This is because it is a time when the instinctive tendencies assert themselves very strongly and at a time when the individual is expected to conform to the social conventions. As a matter of fact, he has had very inadequate experience. He has not accumulated wisdom, and he has not had the time to acquire self-control; so he is faced with the necessity of conforming when it is pretty apt to be beyond his powers to do so. I am sure that this state of affairs must be pretty generally known, and yet it is never taken into consideration, at least by the law.

A very large proportion of delinquencies occur at this time, and a not inconsiderable number of very serious crimes are committed. Homicides are by no means infrequent, and I am sure that prison wardens would tell you that this is the period when serious crimes are most apt to be committed, and when men and women first enter upon their criminal careers. A judge who told me that he had just sentenced a 14-year-old boy to be hanged for murder, and went on to explain that the boy knew the difference between right and wrong and that was all there was to it, illustrates in a rather tragic way the total lack of understanding which so frequently faces the young adolescent when he gets into trouble.

The difficulties of the adolescent, whether they be delinquencies or mental illnesses, cannot be understood without appreciating the undue burden of instinctive urges with which he has to cope at his period of life. We can therefore think of him in terms of these instinctive tendencies and his capacities for dealing with them in accordance with accepted standards of conduct. Either his instinctive tendencies are too strong or his self-control is too weak, or both, when he gets into trouble.

But let me interject at this point a suggestion which I think is always helpful in understanding these situations. A boy whose instinctive tendencies are not strong enough when he is an adolescent to get him into more or less mischief is a boy whose equipment for life is lacking in the necessary energy to carry him very far; or, to put the thing a little differently, the goody-goody boy, the boy who never makes any trouble, who has all of the virtues and none of the vices, is pretty apt to be fundamentally a weakling. I inject this comment because I think it is of significance and importance, and because I believe many a boy is wholly misunderstood because this matter of

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energy equipment is not appreciated, and then, again, I have injected it because I believe that such a concept makes for greater tolerance as well as understanding of adolescent delinquencies; and helps the adult who has to deal with them to that frame of mind which sees the situation in its true light and enables him to guide the youth rather than use methods so frequently employed which are destructive.

All of this, you see, naturally leads to the inevitable conclusion that the adolescent's assets and liabilities are conditioned by what has happened to him in his bringing-up during the previous years. In other words, a successful adolescence is dependent upon adequate care and training in early childhood; and so at this point I wish to say a few things about the care and training and bringing-up of children which I conceive to be of fundamental importance in this whole question. The present century has been called the century of the child; but very often, I fear, with little appreciation of what a short distance we have come from the crudities and cruelties of the past, and of how much we are still involved in the same emotions that gave rise to them and in ignorance and indifference and selfishness toward the new generation. Many historical facts might be mentioned but I merely wish to call attention to what is common knowledge --that these cruelties of the past were largely practised on the theory that the parents owned the child and therefore he could be sold into slavery or be killed, as suited the parents' convenience.

As you know, China for hundreds of years was the country where infanticide was practised on a large scale; especially the female children being drowned. Edicts from time to time were published against this practice, and in the reign of Koang Sui, which began in 1875—only yesterday—these efforts were continued. But enough for the past. What is the condition at present? I have before me the figures of the National Child Labor Committee, which give a total of over 2 million children under 17 years of age employed throughout the United States in gainful occupations. Some of them are only 10 years old. It is economic pressure which has brought to the fore conditions which we never believed could have existed in this country, and at the same time has emphasized qualities in human beings which we thought, or perhaps only hoped, had been eradicated by civilization.

The high point for the child in the 20th century was President Hoover's White House Conference on Child Health and Protection. It will be noted in *The Children's Charter,* which was issued as a result of this Conference, that the child is entitled to full preparation for its birth. It goes on to state that his mother should receive prenatal, natal, and postnatal care, and that there should be such protective measures established as would make childbearing safer; but I think the first sentence, that the child is entitled to full preparation for its birth, means that the child should be wanted by the parents and that his birth should be arranged for on that basis. An enormous amount of the cruelty of the past was undoubtedly due to the birth of children who were not wanted. Particularly in China, the female child was a liability and was therefore killed, whereas in other places children became assets who could be put to labor, and made to help support the household. These conditions, of course, were most notable where the economic pressure was greatest.

If I were to sum up in a very few words all of the things which it is desirable that a child should have in order that he might emerge into a healthy adolescence, I would say that

he should have a feeling of security in a good home where he can be reasonably provided for, and that in addition to this, and perhaps still more important, the child should know without qualification that he is loved. These are the irreducible minima of healthy childhood; and yet if we will look about us only a little we will see how far we are from reaching such standards even in this so-called century of the child.

I will call your attention briefly to a few illustrations. In the first place, I think I can say without fear of contradiction that on the whole few children are provided for beforehand; that children come into the world more or less by chance and accident; that it is a rare thing for a parent to give as much care and thought to the planning for a child as he would to the planning for a garage, for example. I might go on to say, I think without fear of contradiction, that the child is also brought into the world for various ulterior motives. Not infrequently a wife decides to have a child thinking that thereby she will hold the loyalty and the affection of a husband whose interests are beginning to wander from the home. Whatever the result of such an experiment might or might not be, it is obviously not a fair procedure from the point of view of the welfare of the child.

Other such reasons may be cited, but I have before me a very interesting paper by Dr. Stevenson, of New York, a psychiatrist, by the way, who took the trouble to associate himself with a children's clinic, not in the capacity of a physician to the child but for the purpose of interviewing the mother and finding out why she brought the child to the clinic. It is exceedingly interesting to note that all sorts of reasons besides the health of the child were brought out. For example, one child was brought for the purpose of establishing a stronger case of neglect against the deserting husband by having the physician say that the child was sick. In another case the child's aunt brought the child for examination in order to expose the neglect of its mother in caring for it by getting a diagnosis, the aunt hating the mother for taking away her brother's affection. In another instance the child was brought in order to prove its illness so as to avenge a dead sister by exposing her husband's neglect.

Such were the motives for which children were brought to consult the pediatrician; and I do not need to tell you that in all the work with children for the past quarter century we have almost invariably sought back of the child's illness in the home, and more specifically in the parents, for the cause of the trouble.

The child in the family is very much like a glass of milk in the ice chest, absorbing the flavor of all the personalities about him. Unfortunately, however, often this passive attitude does not sufficiently describe the situation, for the members of the household not infrequently use the child, as I have already indicated, as a means by which they can express their emotions, their animosities, their angers, etc.

You will see that I have wandered somewhat from my title but I wandered only in a direction which I intended to take. I have indicated that a healthy adolescence is dependent upon a healthy childhood, and then I have pointed out some of the defects in our modern attitude toward and understanding of childhood and children.

In setting forth the minimal requirements for healthy childhood I mentioned only 2—a good home and love. There is a third requirement which perhaps includes the other 2, and that is that the parents should be worthy objects of emulation for the child, that they should have personalities which the child can take over and idealize with the certainty that they will consti-

tute standards of conduct that will result in the building up of a healthy character and a good citizen. With all these requirements it is easy to see that we have the ideal setting for wholesome childhood, and this is the most certain assurance of a healthy adolescence. Of course, it is rather difficult to see how this last requirement can be brought to pass except as a result of many generations of development, but perhaps if only parents who wanted children had them a big step would be taken in this direction.

If the 20th century is properly called the century of the child, then it is only because in this century the child has been discovered. We have not yet learned how to treat him, and, what is much more difficult, we have not learned that the parent needs the child as much as the child needs the parent. There is a mutual exchange in the parent-child relationship which is of the utmost importance, in my opinion, for civilization. It is only in the family relation, where sacrifices have to be made on account of children that those elements of altruism, sympathy, understanding, and tolerance are born which make the future of civilization worth struggling for.

DISCUSSION

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THE previous speakers have provided us with a rich nourishing bill-of-fare on the mental hygiene of childhood. I would like to congratulate those who are responsible for arranging this program in securing 3 outstanding psychiatrists who have contributed to the development of the mental sciences and who command our respect because they have gained valuable insight into the human nature of children through day in and day out intimate clinical contacts.

All 3 speakers emphasized the point that, for each stage of a child's development, there should be adequate previous preparation. Dr. Wile informed us that happenings before the age of 2 influence the preschool age period of 2 to 5; Dr. Richards suggests preschool age experiences as potent factors in determining later child development; and Dr. White reiterates the same philosophy in speaking on adolescence. This seems to me to be one of the cardinal principles in the whole domain of mental hygiene—that the effective safeguarding of mental health consists in laying the foundation at each stage of life for the sake, not only of satisfactory adjustment during that particular stage, but as preparation for the next age range. It is because of this principle, for example, that we as health workers are concerned with the so-called patterns of reaction at the preschool age level, knowing that there are involved determinants for the direction of future personality growth. Indeed this principle carries through from birth to death. We are, for example, determining in our 40's, in considerable measure, the degree of our mental health in our 50's, and so on.

Dr. Richards's hesitation to utilize the term mental health because of the dangers to our thinking in the tendency to separate the mental from the physical

or the mind from the body is in line with common sense. The sooner we include in our conception of health what we have previously dealt with in a sectional way under physical health and mental health the better. A unified approach does more justice to the facts and facilitates more effective application.

And now, may I hazard a few observations concerning the relationship between mental hygiene and public health, and developments that are perhaps worthy of our support. I will be brief because I realize that it is not the function of a discussant to present a paper of his own.

In the first place, I would say that, unless mental hygiene becomes thoroughly integrated into public health philosophy and practice, it will not achieve its main objectives, and I have come to the conclusion that we who are identified with the so-called mental hygiene movement have been slow, not perhaps in realizing this need, but in formulating our experience so that it can be readily used by the rank and file of public health workers. What is requisite in this regard? We must approach the subject of mental health in a positive way. We must set forth, as far as our experience enables us, the conditions for healthy mental development. This has been done to a considerable degree in regard to physical health. In this realm the public health worker recognizes the importance of such positive measures or factors as fresh air, sunshine, a balanced diet, vitamins, exercise, and so on. The time has come when we must organize our mental hygiene knowledge so that we can lay down something approaching definite measures that public health workers can understand, promote, and apply in their daily work.

As far as adults are concerned we are now in a position to indicate at least a dozen factors that are of vital importance in the preservation of mental health, such as, for example, occupation, recreation, suitable outlets for creative imagination, social intercourse, the gratification of ego urges in healthy ways, and so on. My confrere, Dr. George K. Pratt, has just written a booklet which I hope will be widely read by health workers, setting forth positive measures that are applicable particularly to those who have become victims of unemployment.

It is in the realm of childhood that public health workers can be most effective. Now that mental hygiene is sponsoring studies in child development and is beginning to discover the factors that lead to mental health on the one hand and to departures on the other, there is prospect of rich material for public health. The papers here presented are illuminating in this regard.

Before concluding, I would like to thank leaders in public health for the help they are giving in fostering sound developments in our field. During the last few years this coöperation has been magnificent. These leaders appreciate the fact that public health must be interested not alone in longevity but in the quality of life as well, and it is in this direction that mental hygiene has a potentially significant contribution.

The Aim and Accomplishments of a Health Center Mental Hygiene Program*

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THE Bellevue-Yorkville Health Demonstration is financed by the Milbank Memorial Fund for the purpose of trying out approved methods for the prevention of disease and the promotion of health with more generous appropriations than are ordinarily at the command of public health authorities and private agencies. The district in which its activities are being carried on extends from 14th to 64th Streets on the east side of Manhattan, with Fourth Avenue as the western boundary below 42nd Street and Sixth Avenue above. The total population of the district is about 142,000. Dr. Shirley W. Wynne, Commissioner of Health of New York City, is Chairman of the Demonstration.

The nursing staff is composed of approximately 30 Health Department graduate nurses under the direction of the Bureau of Nursing of the New York City Department of Health, with which organization the Demonstration is not only coöperating and closely affiliated, but which also serves in the capacity of the official agency in the district.

The family case load of each nurse averages 300 while the individuals handled by each average 400. Besides dealing with the health problems of these families, the nurses are assigned to the schools in the district and in this way are closely in touch with the school authorities and teachers of both the public and parochial school systems.

From April, 1929, to February, 1930, the Demonstration maintained a mental hygiene consultation service. This service was purely advisory; all problems needing intensive investigation and treatment were referred to mental hygiene clinics in the community. The staff consisted of one psychiatric social worker who functioned as part-time consultant.

In November, 1930, as an experimental undertaking, a complete mental hygiene unit was established as part of the Demonstration. This unit consists of a part-time psychiatrist, a part-time psychologist, and a full-time psychiatric social worker. The service is still largely for consultation, but now that more complete diagnostic facilities are available, treatment can be given to a few cases definitely needing psychiatric therapy. Assuming that this audience is especially interested in the educational aspects of the mental hygiene program, particularly as related to the nursing staff, we shall stress that aspect of the service rather than give the actual results of the clinic service, such as the number and type of patients treated, etc.

This is the first time that the City

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Health Department has embodied as part of its services a psychiatric unit, and, as such, it is an important demonstration in public health work. Besides believing in the advisability of demonstrating the need for a psychiatric clinic in a city health center, the directors of the Demonstration felt that more knowledge on the part of the nurses regarding personalities and their deviations would be a most useful adjunct in handling the other health problems as well as decreasing the incidence of mental and behavior difficulties in the district by early diagnosis and treatment. The experiment was more of an educational nature than that of offering clinic service to individuals, based upon the desire to attack mental illness by prophylactic measures.

This audience is only too cognizant of the fact that lack of knowledge engenders fear, particularly in preventive medicine. We are all too familiar with cases of pulmonary tuberculosis being diagnosed as "lung fever" and treated as such. A tragically high mortality resulted because no therapy is effective for a nonexistent, in other words wrongly diagnosed, malady. This make-believe disease was begot of primitive fear due to ignorance. For example, 10 years ago a confrère told me that he did not report his cases of active tuberculosis because he had to make a living, implying that the patients would seek another physician if he reported the illness. Gradually, through education, the morbidity and mortality rates of tuberculosis are decreasing steadily. Through education, the taboos have been removed from many abnormalities, and even with venereal disease marked strides are being made in the willingness on the individual's part to admit of an accurate diagnosis.

With mental illness, however, we are woefully lagging in this regard. One reason for this is that mental disease connotes to the layman legal insanity. Naturally, no legally sane person wants to be considered insane; hence he avoids any admission of a term that smacks of insanity. Another impediment in the way along the road to a clearer understanding of mental disease is the social stigma attached to any form of so-called misbehavior. We are urged in our youth to approach perfection in some way and any inability along this line is viewed as antisocial, amoral or unethical. No one enjoys being labelled under any of these terms. There are numerous other causes why mental disease is a type that people fear most. Due to ignorance it is the pariah of medical pathology.

We, therefore, realized that an enlightenment of our population would most effectively be achieved by giving the nurses who served the people a clear understanding of mental hygiene principles. If the individuals in the community were to be reached the nurses would be among the ones to do it. Public health nurses are in a peculiarly intimate contact with their patients and because of this unique relationship can exert an immeasurable influence.

In my opinion, our nursing group of Bellevue-Yorkville, in their educational status and work efficiency, measure up to any similar group, yet they feel the need for more knowledge about the handling of personalities. Partly because of their making known this need, the directors were led to take the establishment of a clinic under advisement. The nurses have since realized more than ever that a mother's lack of coöperation in the administration of toxoid or in carrying out the doctor's recommendation concerning the baby's diet may be a mental hygiene problem. To give the nurses enough knowledge so that they could deal with personality deviations and through them to permeate the community with greater mental health was our main objective.

The question of method then presented itself. How were we to teach a group enough psychiatry so that they could recognize mental problems and be able to carry out certain types of treatment with the help of the mental hygiene staff? The methods chosen to achieve our aim were group discussions, not formal didactic lectures, individual conferences on cases referred to the clinic and personal interviews if they were desired. The individual conferences gave us a clearer view as to the efficiency and personality of each nurse, which in turn, was of great benefit in leading the group meetings. These latter were held twice a month, the first hour in the morning. The nurses were expected to attend the conferences and were excused from their other work for the hour unless a clinic was in session, in which case some few had to be on duty. Occasionally, for other personal reasons, a few nurses were excused from attending. Because of the desire to avoid rigidity and formality, the students were free to interrupt by discussion or questions. In this sense we cannot designate the conference as a lecture.

In all teaching there are certain essentials that the instructor must possess. The primary ones are a knowledge of the subject coupled with the sincere conviction in the soundness of this knowledge, a non-defensive and non-patronizing attitude to those whom he is to teach and above all an understanding and knowledge of the students at least collectively, preferably individually also. We shall not dwell upon the first of these; that can be readily determined by one's previous training and professional rating.

Regarding the attitude to the student body, what had to be coped with at the first meeting was the age-old defense of nurse to doctor. Even though it were in the scope of this paper we could not solve the problems of why the nurse resents and yet is fearful of the supposed superiority of the person with an M.D. degree. At first they asked no questions and offered no ideas. They were dutiful, courteous, but silent listeners. They gave us the feeling that we were trying to impress them with profound and erudite ideas. Gradually, by individual conferences on cases that had attended clinic and whom the nurse was handling in the school or in the home, a rapport was established that made our bringing them into the group discussion more possible. We have tried to be neither unconvincing nor coercive, and above all desired to prevent an emotional deafness to mental hygiene; thereby symbolizing a faulty relationship between teacher and pupil. All of us are too reminiscent, unfortunately, of the teachers in our lives who have checked our enthusiasm in a subject solely by their personal contact with us. In that way, many an intelligence rating has been lowered by our emotions. It is the responsibility of the teacher to prevent such a happening, as his function is to develop, not inhibit potentialities.

Closely allied or coupled with the importance of teacher-student attitude is the too frequently disregarded necessity of the teacher finding out how much the student already knows about the subject to be taught and how much the student at the time is capable of grasping, both intellectually and emotionally. We found out that, as is the usual condition, these graduate nurses had had no adequate course in psychiatry during their training. Some had attended lectures and read since graduation but few had any appreciation of the meaning of psychiatry and mental disease. We therefore had to begin at rock bottom, which has the advantage of eliminating any prejudice or faulty knowledge of the subject. Having determined how little they knew about mental hygiene, the next task was

gradually to ascertain how much they then could learn.

The extension of knowledge or learning is dependent upon cerebral cortical endowment and the desire to learn. The cortical equipment of the group was more than adequate for a sound evaluation of mental hygiene. They were of normal intelligence capacity, otherwise they could not have arrived at and accomplished in the nursing field what their positions demanded. Our job was first to attract their attention and arouse their interest to such a degree that they desired and felt the need of more information about human reactions, and, secondly, to satisfy this need. May we say that in the beginning ultra-technical words were omitted based upon the fact that only through verbalization can an idea become conscious and thereby understandable. If wholly unfamiliar words had been used the extension of the field of psychiatric knowledge would have come to nought. Gradually, as the ideas were assimilated and digested, then the technical words became associated with and attached to the ideas.

The following topical outline indicates the approach we made. After we distinguished between neurology, psychiatry, mental hygiene, and psychoanalysis, they then knew in what realm the discussions were to be. Following this, we took up the basic principle of the organism-as-a-whole or the totality of the living being, whether plant or animal, and considered the life reaction, for example, of the ameba, the fish, the tiger, and man. We viewed the psyche as the manner by which each organism conducts itself in its particular life setting and dwelt upon the fact that mentality is not an organ or system that has been added to or superimposed upon other organs or systems at some era in the process of development. We therefore eliminated the unsound conception that is so prevalent, of heredity versus environment and mind as separated from body.

Even though the final word regarding instincts has not been said, we, nevertheless, tried to show that the instinctual basis of behavior is common to all mankind and that the degree, intensity, or quantity of response determines health or ill health and that this determination has a discoverable causation traceable to the relationship of parents to each individual child, who in turn has a certain biological equipment. In taking up the psycho-sexual development of a child, the family setting was again gone into more fully. It was our hope that the term "sex" would be enlarged in their opinion and not be thought of as a curse or blessing from mother nature, in this way to view masturbation, homosexuality and perversions as stunted emotional development rather than moral degeneracy. The term "sexual satisfactions" was divorced from the limited sphere of prostitution and immorality.

To one discussion we gave the title of "The Contagion of Mental Disease" and by explaining the mechanism of identification somewhat clarified the old adage of "Like father, like son." In this way habit formation and response to stimuli were made synonymous with the dynamics or the manner by which the specific organism operates. Other mechanisms were, of course, explained and an attempt was made to illustrate how recognizable they are in types of both normal and abnormal personalities. For example, when a patient formerly might be described as uncooperative or untruthful, terms alas, which too frequently appear on the case records of every organization, an attempt was made to understand what he was trying to do and what emotional gratification he was seeking.

Because of the important rôle of the unconscious in one's mental life, the structure of the psyche and its develop-

ment were discussed in relation to reactions that are not regarded as abnormal. In this way the gap between the normal and the pathological mind was bridged and a correlation between mental hygiene and such social problems as alcoholism, unemployment, or communism, seemed pertinent. Often, the nurses would request a discussion of such problems—to illustrate a specific case. The morning after "Two-Gun" Crowley was electrocuted because of his having murdered a New York policeman, the hour was devoted to looking at the antisocial and criminal man through the lens of a psychiatric microscope. Endowed with only a limited intelligence, the son of an ignorant peasant girl and policeman, born out of wedlock, boarded at baby farms, with no family life in early years, with no one who cared for him but a foster-mother with whom he lived in later childhood, and with a fixed paranoid trend toward policemen and social authority—all of these facts made his crime more understandable to the group.

At various meetings other specific cases were analyzed in the light of causation in order that the students might appreciate that to understand the motivation of surface behavior is just as necessary for therapy as to determine whether or not a fever is caused by a typhoid or tubercle bacillus.

It may seem irrelevant to mention a problem that too often presents itself in the present-day teaching of mental hygiene and psychiatric principles. It is one which we have tried to eliminate because we believe it must be eradicated before mental hygiene can come to its just fruition. We refer to the cleavage existing between the medically and non-medically trained personnel. Several years of personal experience have brought us in touch with both groups and there has not yet been great progress made in healing the breach due to their previous training. The medical schools and hospitals, the only places where physicians and nurses can get their training, have stressed organs, systems and body; therefore, the human being is understood only through anatomy, physiology, and pathology. On the other hand, social workers and educators are also alive to the mental hygiene movement, partly because they are meeting a need that was not met by the medically trained person, either physician or nurse. In turn, they are educated in our general colleges and schools of social work where the emphasis of man has been placed on that subtle thing called "mind" and only through academic psychology, philosophy, economics and sociology, has he been explained. Unless the two groups can come together, mental disease will not be understood and prophylactic measures in our homes and schools will be wanting. We do not propose that educators and social workers must study medicine, neither do we feel that a capable nurse must be also a doctor of philosophy, but if any of us, in whatever sphere, are to play our part in helping individuals deal with themselves in life's setting, we cannot consider human reactions as a psychological phenomenon coming from out the "blue," nor as the result of chemical imbalance, but rather regard behavior as the motor response from external and internal stimuli to the entire organism and not from thought processes alone.

This, we trust, has been our approach in teaching these nurses. We have omitted discussions regarding various schools of psychopathology, and we have not given them the symptomatology of the different clinical entities met with in psychiatry. We have adhered to no set curriculum except that determined by their desire to learn more.

Mental illness is a social problem; so

are tuberculosis and diphtheria; but all must be thought of in the words of Francis W. Peabody when he said, "What is spoken of as a clinical picture is not just a photograph of a man sick in bed, it is an impressionistic painting of the patient surrounded by his home, his work, his relations, his friends, his joys, sorrows, hopes and fears." A knowledge of mental hygiene gives to these words a real meaning.

In order to evaluate our results we asked the nurses recently to express in a few words whether or not the mental hygiene service had been of value to them in any way. They were told that the opinions could be signed or unsigned, as they wished. Twenty-six replies came in—of these, 1 wrote "No"; another response was "I attended very few of the lectures so cannot give a fair opinion. The few I attended I did not enjoy as I always feel that Dr. Adamson is too positive in her assertions and creates a definite negative reaction in me." The other 24 replies were positive that the service had been of definite value by obtaining better results in the following ways, as expressed in their words:

In practical work in the field; approach to families; solving reasons for refusals and combating refusals; understanding the human side of life; better contact and more tact; realization that our failures are in many instances due to faulty approach; adjustment to my own family problems, also staff; understanding more problems with which we are confronted in our families; effort to take away one thought from each discussion; development of greater tolerance and understanding of people; recognizing and handling situations met in the homes and school, particularly in dealing with children and teachers, so that now the pupils, teachers, and nurses have more understanding of each other; improvement in group adjustment; applying these methods to everyday work have found them very effective; being more able to account for attitudes of many contacts; helping me to see why coöperation could not be obtained due to mentality of the individual.

Based upon these opinions and those of other staff members, we can now say with conviction that a mental hygiene service is a desirable component of a health center, particularly in the educational value to the nurses.

Our project is now completing the second year and we believe a continuation of it is more than justified if we expect nurses to render a real service in the field of public health.

Unemployment

THE Save the Children International Union with headquarters at Geneva recently decided to make a study of the effects of unemployment on children and adolescents. It is expected that this study will be of practical value in showing among other things the need for more extensive child welfare work and the mistake of curtailing it for reasons of economy. The study will also allow a comparison of the effectiveness of the measures taken in the different countries.

At first a detailed study in a number of countries was planned, but later it was decided to limit the study to Belgium, Germany, Great Britain, Hungary, Switzerland, and the United States, and to publish the report in the near future.—*Nouvelles de l'Union Internationale de Secours aux Enfants*, Geneva, Oct., 1932.

Effects of Air Contaminants on the Natural Light of Cities*

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SINCE 1911, Mellon Institute of Industrial Research has been interested in the problem of air pollution, particularly in industrial communities, and has in progress a program of investigation of the causes and effects of air contaminants, especially those resulting from the combustion of fuel.

Of major importance in a study of the effects of air pollution is the determination of its action in obstructing natural ultra-violet radiation, particularly in the shorter wave lengths. The primary purpose of the present paper is to give some data obtained from 12 months' continuous records of ultra-violet radiation in the region below 3,350A. Seasonal and certain monthly, daily, and hourly variations are shown; reception on clear days is contrasted with that on partly cloudy days, on cloudy days, and on days when there was a blanket of light smoke. The paper should be considered one of a series, the first of which has been presented elsewhere.[1]

Data are taken on the roof of the City-County Building in Pittsburgh, which is 9 stories high, with the flat roof 163 ft. above the street—933 ft. above sea-level.

The apparatus employed has been described at length in the paper cited. In consequence, the description given in the present contribution will be condensed, and sufficient only to make the findings understandable.

* Read before the Public Health Engineering Section of the American Public Health Association at the Sixty-first Annual Meeting in Washington, D. C., October 25, 1932.

INSTRUMENTS

Receiver—We have been and are using a Rentschler Ultra-violet Meter designed primarily as a dosage meter to determine the amount of ultra-violet necessary to produce erythema. At the inception of the study, necessary modifications were made in insulation, housing, capacity, etc., to adapt the instrument for continuous use outdoors.

The essential feature of this meter is the photo-electric cell with Corex D bulb; the uranium plate cathode of the cell has an area of approximately 12 sq. cm. Current flows only when ultra-violet radiation between the approximate limits of 2,700A and 3,350A falls on the cell.

The amount of current is proportional to the intensity of the ultra-violet, although this current is very small—approximately 0.1 micro-ampere for fairly intense radiations. It is necessary to amplify this small current and hence, actuated by a 180-volt battery of dry cells within the cabinet, a glow relay or starting anode tube is placed in the circuit. Connected to the ultra-violet cell is a condenser, which is slowly charged by the current trickling through the cell. Thus the time of charging the condenser to a fixed quantity is proportional to the intensity of radiation. When this fixed quantity of charge is reached, the condenser spills over and the tube "breaks down" and an impulse of current flows, operating either a click recorder or a graphic recording meter.

This photo-electric cell, properly

used, has a constant sensitivity within the range of measurable accuracy and, according to Rentschler, shows no change or aging over a considerable period of use. Different cells, however, have different sensitivities and each must be separately calibrated against a quality of source closely similar to the one to be measured. Particular attention must be given to insulation of connecting leads, to prevent leakage to ground or around the condenser.

It may be noted that the instrument actually integrates or records intensities and amounts (or time-intensities) of ultra-violet radiation, but at present, for lack of the proper terminology, there can be no absolute units of value assigned to the data. In these studies the designation "Rentschler Ultra-violet Unit" is used (a unit being, arbitrarily, one click from the meter), in terms of which the readings are given. The responses were not uniform through the year, because neither the same box nor the same cell was used throughout, and because condenser capacities were changed from time to time to increase or decrease the amount of ultra-violet necessary to break down the glow relay tube. The meters were therefore checked as described below, and the record of responses brought to a uniform standard, which was fixed at 29 clicks per minute.

Checks are made frequently (normally once a week) against a Mazda Type S-1 lamp. This lamp is very susceptible to temperature changes and to position of burning. The method of checking used here is to burn the lamp in a vertical position for 30 minutes, then to take the response of the meter at a definite distance (24") during the next 15 minutes. If more time is needed, the lamp is allowed to cool and the process is repeated.

Solar Table—With the present construction of the Rentschler meter, the cell is fixed in a position perpendicular to the base of the box. Therefore, in order that direct sunlight shall fall normally on the cathode, the box must be at an appropriate angle and must rotate in a plane parallel to that of the sun's apparent path. To provide for this position, the solar table was devised. It consists of a table set on a north and south axis and carrying a circular disc, set at an angle of 40°, 30′, corresponding to the latitude of Pittsburgh. To this is attached a cradle—for the meter—with an adjustment for declination. The table is connected, through gears and shafting, to a 1/6 H.P. synchronous motor, which has a speed of 1,800 r.p.m., the table making one revolution per day. Thus the cathode of the photo-cell is kept normal to the sun.

The meter is covered with a bakelite box, with a 5" sphere of Corex glass, frosted inside, over the cell. Similar Corex bulbs were tested by the Westinghouse Lamp Company to make certain that no appreciable solarization could occur.

While the cathode of the photo-cell is normal to the sun, it receives radiation from an appreciable angle. In addition, the frosted Corex bulb is integrating and adds to the amount of skyshine received. Hence the total amount of ultra-violet radiation which reaches the cell is the direct plus a considerable percentage, but not all, of the diffuse or reflected radiation.

Recorder—The impulses from the meter are transmitted to a Westinghouse watt-hour demand meter, type RA; the pen is set to trip at 5-minute intervals.

Results from the records are chiefly comparative, and it should be remembered that very little solar radiation reached the cell that was of wave length shorter than 3,000A, hence not of maximum effectiveness in producing erythema. To correlate graphs with erythema, it may be helpful to note that

the maximum biologically active ultra-violet values at midday represent a minimum perceptible erythema in about 20 to 30 minutes.

EXPERIMENTAL FINDINGS

Figure I is a comparison of a clear day in June with a clear day in December. The values indicated are the recorder readings at 5-minute intervals throughout the day. Note the effect of light clouds during the middle of the day in June.

Wherever possible, checks were made to determine the accuracy of methods used. In this case, for example, the altitude of the sun at noon on the day in December was found to be practically the same as the altitude of the sun at that time on the day in June when an equivalent amount of radiation was received. This indicates accuracy of method and linearity of response of the meter.

Figure II indicates, for each month from July, 1931, to June, 1932, the average time of sunrise and sunset and the average time of beginning and ending of ultra-violet radiation below 3,350A. Considering as maximum the highest value in ultra-violet, as received at midday on a clear day in June, the chart indicates the average beginning and ending time for 75 per cent, 50 per cent, 25 per cent, and less than 25 per cent, respectively, of this maximum. The reason for making such divisions is that only a part of the ultra-violet received is in the "therapeutic band," which is between 2,950A and 3,150A. Those desiring to estimate when this band may be expected to be present may do so from the chart, keeping in mind the limitations within each division. The spectrographic study to determine shortest wave lengths at different times during the year is not completed, and hence cannot be included in this paper.

The time given on this and other charts referred to in this paper is local apparent time.

In Table I are given averages of daily totals, averages for days when there was

FIGURE I

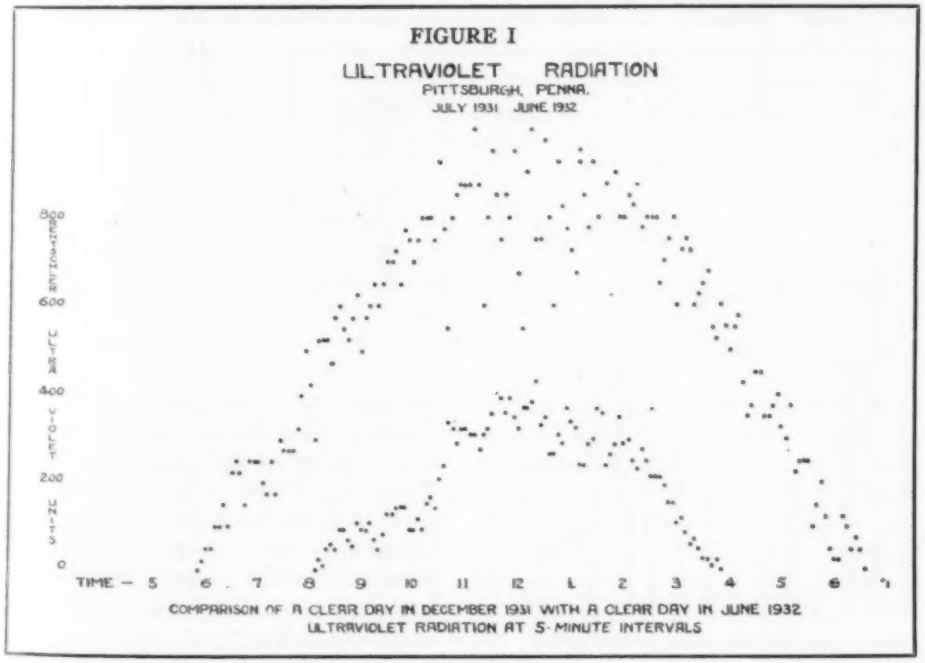

ULTRAVIOLET RADIATION
PITTSBURGH, PENNA.
JULY 1931 JUNE 1932
800
600
400
200
0
TIME — 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7
COMPARISON OF A CLEAR DAY IN DECEMBER 1931 WITH A CLEAR DAY IN JUNE 1932
ULTRAVIOLET RADIATION AT 5-MINUTE INTERVALS

TABLE I

AVERAGE OF DAILY TOTALS

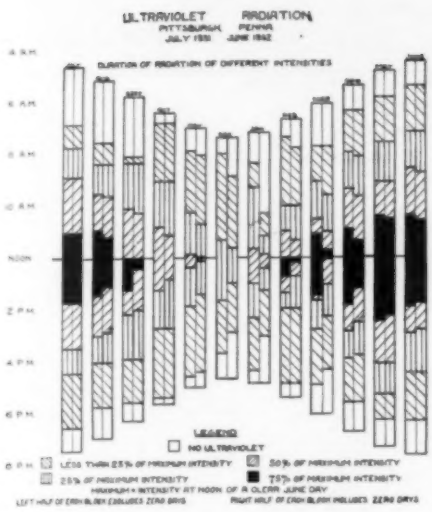
Month	Clear Days						Partly Cloudy Days					
	Light Smoke Blanket				Days	Avg.	Light Smoke Blanket				Days	Avg.
	Days	Without	Days	With			Days	Without	Days	With		
1931												
July	5	70,465	0		5	70,465	12	63,155	0		12	63,155
Aug.	2	69,880	0		2	69,880	11	60,120	2	48,760	13	58,375
Sept.	2	50,225	2	35,745	4	43,000	13	46,665	0		13	46,645
Oct.	3	40,915	4	27,270	7	33,245	6	43,260	4	28,120	10	37,205
Nov.	2	31,025	2	23,790	4	27,410	6	25,780	3	21,990	9	24,520
Dec.	2	23,980	1	18,920	3	22,230	4	14,630	0		4	14,630
1932												
Jan.	1	27,245	1	20,070	2	23,660	5	33,270	1	18,905	6	30,395
Feb.	2	45,660	2	17,775	4	31,720	6	25,800	3	19,940	9	23,850
Mar.	0		0		0		5	56,750	0		5	56,750
Apr.	4	73,730	0		4	73,730	9	63,080	0		9	63,080
May	6	85,730	0		6	85,730	8	64,235	1	41,115	9	61,665
June	2	76,000	0		2	76,000	7	67,895	1	51,750	8	65,630

Month	Cloudy Days						Daily Averages			
	Light Smoke Blanket				Days	Average	Excluding Zero Days		Including Zero Days	
	Days	Without	Days	With			Days	Average	Days	Average
1931										
July	5	52,035	0		5	52,035	22	62,490	22	62,490
Aug.	6	30,075	0		6	30,075	21	51,380	21	51,380
Sept.	3	36,270	0		3	36,270	20	44,360	20	44,360
Oct.	7	25,450	4	22,890	11	24,520	28	31,230	28	31,230
Nov.	9	13,550	5	8,520	14	11,755	26	19,030	27	18,327
Dec.	3	9,300	13*	5,315	16	6,065	17	13,075	23	9,660
1932										
Jan.	2	14,510	12	3,820	14	5,350	13	18,940	22	11,195
Feb.	2	24,300	10	15,585	12	17,035	25	21,835	25	21,835
Mar.	9	28,280	8	12,150	17	20,690	19	33,445	22	28,885
Apr.	7	59,180	6	23,290	13	31,870	26	49,075	26	49,075
May	5	49,490	0		5	49,490	20	65,840	20	65,840
June	5	60,225	3	31,050	8	45,640	18	59,340	18	59,340

* Includes 3 days of rain.

a light smoke blanket all day, and for days when there was no such blanket. The number of days used in making up these averages was 75 per cent of the total number of days in the year. Those omitted included days on which the meter was taken inside for checking, the records for such days being incomplete; days on which the meter was not operating by reason of temporary failure of a relay (which occurred several times, owing to the variable strain on the spring of the relay caused by the great variation in angle as the box revolved with the solar table); failure of glow tube (which happened twice); loosening of cement between base and cover of photo-cell; and days when the

FIGURE II


ULTRAVIOLET RADIATION
PITTSBURGH, PENNA.
JULY 1931 - JUNE 1932
DURATION OF RADIATION OF DIFFERENT INTENSITIES
LEGEND
NO ULTRAVIOLET
LESS THAN 25% OF MAXIMUM INTENSITY
25% OF MAXIMUM INTENSITY
50% OF MAXIMUM INTENSITY
75% OF MAXIMUM INTENSITY
MAXIMUM INTENSITY AT NOON OF A CLEAR JUNE DAY
LEFT HALF OF EACH BLOCK EXCLUDES ZERO DAYS
RIGHT HALF OF EACH BLOCK INCLUDES ZERO DAYS

morning record indicated the possibility of leakage caused by moisture. The averages are incomplete to this extent, but the trends are correct, and it is believed that the averages are approximately so.

The effect of smoke and of "zero" days—when no ultra-violet at all was received—will be considered later.

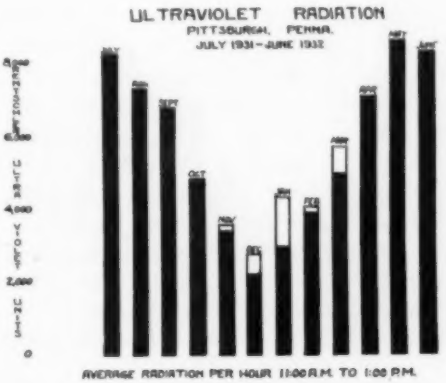
In segregating the clear, partly cloudy, and cloudy days, the system used by the U. S. Weather Bureau has been followed: 1.0 = completely overcast; 0.1 to 0.3 = clear; 0.4 to 0.7 = partly cloudy; 0.8 to 1.0 = cloudy. It is obvious that, while this scale gives the sky condition as to extent of cloudiness, it does not include, in the latter two groups, the extent of direct sunshine. The classification is used as mentioned, however, for this general analysis; for a more detailed study for later presentation, a combination of the percentage of cloudiness and the extent of direct sunlight will be followed. Days of light smoke are those on which the visibility was at no time greater than 8 miles, as a result of smoke and dust as distinguished from other obstructions to vision. On many other days there was smoke during the earlier morning hours and the later afternoon hours, but such days are not included as days of light smoke in this paper.

In order to indicate the trend through the seasons, Figure III is shown for the two hours from 11 a.m. to 1 p.m. (1 hour on each side of noon), for clear periods only. The averages are in Rentschler ultra-violet units per hour. Attention is again called to the fact that the responses from different meters will not be the same; while, with another meter, trends would be comparable, for direct comparison of amounts the records would need to be adjusted to the same number of clicks per minute (*29*) under the same standard conditions as mentioned previously. In addition, the effect of "zero" days is indicated, the solid part of the column being the average for all days, while the height of the open portion indicates the average for the month excluding "zero" days.

The hourly averages 11 a.m. to 1 p.m., for clear days only, are again shown in Figure IV. It will be noted that, with one exception, the periods when there was a blanket of light smoke occurred during the heating season.

Figure V is an attempt to show, graphically, not only a comparison between clear periods (11 a.m. to 1 p.m.),

FIGURE III



partly cloudy periods, and cloudy periods, but also in each group the difference between days designated as having light smoke and days not so designated. This latter comparison is not so trustworthy for partly cloudy and cloudy days as it is for clear days, because of the variable intensities within these groups, owing not only to differences in extent of cloudiness, but also to the type of clouds. The chart points to the desirability of a closer analysis, which will be made subsequently.

At the Pittsburgh station of the U. S. Weather Bureau is a pyrheliometer, which records the intensity of total solar radiation (infra-red, visible and some ultra-violet). Figure VI is a correlation of total solar radiation with ultra-violet below 3,350A, as recorded by the Rentschler ultra-violet meter on the roof of the City-County Building, both taken for clear hours only between

FIGURE IV

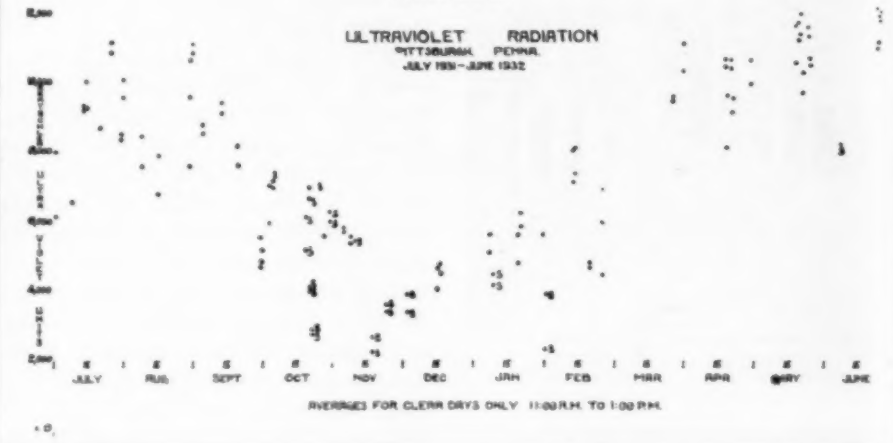


FIGURE V

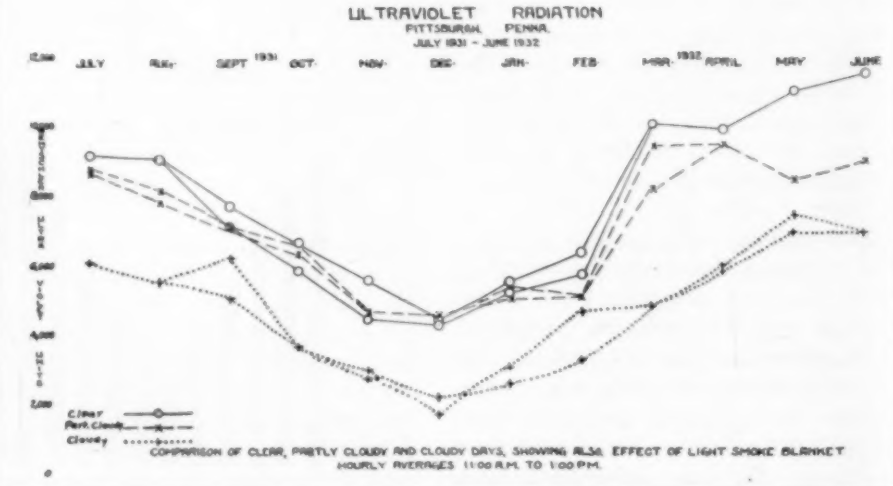
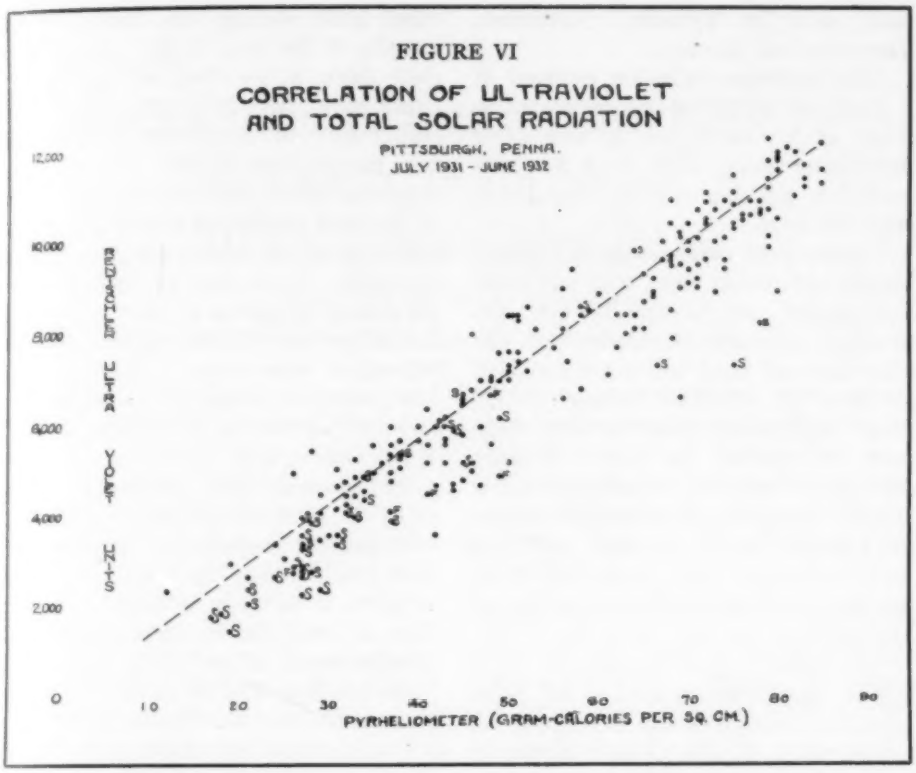


FIGURE VI

CORRELATION OF ULTRAVIOLET AND TOTAL SOLAR RADIATION



10 a.m. and 2 p.m. The ordinates on the chart are Rentschler ultra-violet units, the abscissae are from the pyrheliometer, in gram-calories per sq. cm.

DISCUSSION OF RESULTS

It should be kept in mind that the uranium photo-cells used in the Rentschler-ultra-violet meters from which the accompanying data were taken are not sensitive above 3,350A; the radiation reported is between that wave length and the lower limit of sunshine.

The time during which such radiation was received on clear days varied between 5:30 a.m. to 6:35 p.m. (12¾ hours) for June, and 8:05 a.m. to 3.50 p.m. (7¾ hours) for December.

Only a part of this radiation is in the therapeutic band, so for purpose of comparison the time chart (Figure II) was prepared to show duration of various percentages of the maximum—maximum being the amount of radiation received at midday on a clear day in June. On this basis, and considering the time between sunrise and sunset for each month as 100 per cent of possible time, it will be noted that the total time between the first and the last response of the cell was about 80 per cent of the total number of sunshine hours throughout the year, with variations from about 75 to about 85 per cent.

Radiation equal to or greater than 25 per cent of the maximum intensity extended over an average of 45 per cent of the number of sunshine hours, with variations between 66 per cent in June and 14 per cent in December; for 50 per cent of maximum, the percentage was 24, with variations from 48 per cent in May to zero in December; and for 75 per cent of maximum, 8 per cent average varying from 25 in May to 1 in February

and zero in October, November, December and January.

The maximum radiation received in a 5-minute period on the clear day in June, shown in Figure I, was 1,000 Rentschler units, while in a 5-minute period on the clear day in December it was 430 units.

Comparisons between clear, partly cloudy and cloudy days, with and without smoke, are limited in this discussion by the broadness of the classifications used, which are standard of the U. S. Weather Bureau. Using their definitions, ratios between high and low months, for totals of daily averages of ultra-violet radiation below 3,350A, comparing June and December, for example, were: for clear days, 3.5 to 1; for partly cloudy days, 4.5 to 1; for cloudy days, 8.5 to 1; and for all days, 6.0 to 1.

The effect of a blanket of light smoke, in obstructing ultra-violet radiation, has been indicated in Figure IV. There were 70 days of light smoke (according to the classification mentioned) in the 6 months October to March, and 15 days in the 6 months April to September. During the 6 months October to March, 50 per cent of the clear days, 26 per cent of the partly cloudy days, and 62 per cent of the cloudy days, or 49 per cent of the total were days of light smoke. On the other hand, during the remaining 6 months of the year, 9 per cent of the clear days, 6 per cent of the partly cloudy days, and 22½ per cent of the cloudy days, or 12 per cent of the total were days of light smoke.

It was mentioned that 75 per cent of the total number of days in the year was used in the tabulations and charts presented. If all days are included, 41 per cent of the period October to March, and 8 per cent of the period April to September were days of light smoke. The proportion is about 5 to 1, whether all or 75 per cent of the number of days in the year is used.

As brought out previously, this paper is really a progress report—a brief general analysis of a part of the data taken during the period. Closer analyses, to be made of these and other data on hand, will be made the subject of other papers in the series. Then, too, further studies will be made, including a comparison of the uranium cell with a titanium cell recently developed by Rentschler.[2]

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Young Unemployed

ACCORDING to a recent ruling by the Federal Government, the maximum age for admission to the continuation courses for unemployed has been raised from 23 to 25 years. In these courses practical work is supposed to occupy about four-fifths of the time. Emphasis is placed on close coöperation among all the public and private agencies interested in unemployed young people for the purpose of obtaining the necessary food and working clothes for those attending the vocational continuation courses. The ruling specified measures for unemployed who have been previously engaged in some work and for those who have just left school.

An appropriation for this work has been made by the Federal Government. —*Deutsche Ztschr. f. Wohlfahrtspflege*, Berlin, 9, 1932.

Antirachitic Activation of Milk by Direct Irradiation With Ultra-violet Rays*

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DURING the past few years practical methods have been developed for the economical production of irradiated milk. Clinical and laboratory experiences have proved the value of such milk for the prevention and cure of infantile rickets. These facts may very properly serve as a basis for discussing direct irradiation of milk from the public health as well as the technical point of view. Before discussing the irradiation of milk as a matter of commercial practice, it is desirable to examine the basic conditions upon which such a development may be predicated. An extension of the practice must, of necessity, take into account the existence and solution of practical problems, both dietary and industrial.

The prevalence of rickets among children less than 2 years of age is acknowledged.[1] Such data indicate that it is the most common nutritional disease of childhood. Its geographical distribution is almost universal, varying in intensity with seasonal and climatic conditions, and influenced by density of population. Surveys conducted during recent years indicate that from 50 to 96 per cent of the younger children in the larger cities of the United States suffer to some degree from rickets. This condition challenges the attention of those concerned with the maintenance of the public health, not only from the standpoint of infant welfare, but also from that of conservation of adult life and national efficiency. The following statement from a British source[2] is pertinent:

> The disease has been long prevalent in this country, and though relatively non-fatal, it is one of the most fertile of the crippling and disabling diseases of childhood. . . . Rickets is a serious factor in national inefficiency, for it often leads to structural malformation of bones and teeth, to a lower power of resistance, and to the occurrence of respiratory complications. Holt observes that the encroachment upon the lungs by a thoracic deformity may in itself be enough to keep a child in delicate condition and retard its growth; such a condition is a constant invitation to acute attacks of bronchitis and pneumonia.

Huldschinsky's[3] discovery of the curative effect of the rays from the quartz mercury vapor lamp when applied to rachitic infants was soon followed by those of Hess[4] and of Steenbock[5] that certain foods could be endowed with antirachitic properties—that what we now know as vitamin D is synthesized in inert material by a mere exposure to suitable radiant energy. The basic character of these discoveries placed at our disposal the fundamental knowledge necessary for the creation of new agencies for the suppression and elimination of infantile rickets. This disease is with few exceptions prevented by a proper dietary

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containing an adequate quantity of vitamin D.

The early reports emanating from American and European sources indicated the efficacy of irradiated fluid or dried milk for the prevention and cure of rickets in infants as well as in experimental animals. These stressed the favorable clinical and biological manifestations, but gave little or no constructive data in regard to the character and amount of activating energy applied to the milk during irradiation. Exposure periods varying from a few seconds to 2 hours were used. Obviously such wide differences in technic were bound to cause variable properties in the irradiated product, and to foster skepticism as to the merits and practicability of direct irradiation of milk, as holding promise of anything further than an interesting laboratory demonstration. Much was left to be done before the value of the basic discoveries could be applied in industrial practice with reasonable assurance of even mediocre success. However, these early demonstrations served a most useful purpose in calling attention to possible developments of major importance, and to the necessity of a standardized method as a prerequisite to extended adoption for use in the treatment of the general milk supply.

Since milk is the sole or major article of diet of every child during the age of greatest susceptibility to rickets, the desirability of having available a milk with a self-contained adequacy of vitamin D for the prevention or cure of rickets is at once obvious. Such a product would provide a new type of prophylaxis, simple in application, economical, and entirely free from the inherent handicaps involved in the use of the better known specifics. However, such an achievement presupposes the correlation and control of basic factors concerned in the irradiation technic. Responsibilities of no small moment are also involved in the general distribution of such a milk, particularly when it is relied upon as the sole protective agent. Notwithstanding the lack of uniform methods and of definite knowledge regarding the control of energy applied in the early experiments, practically all the clinical results were remarkably free from evidence of secondary or toxic effects resulting from the use of irradiated milk.

The industrial application of methods for the direct irradiation of milk must take into account numerous interrelated factors. Facilities must be provided for the exposure of large volumes of milk to suitable ultra-violet radiations within short periods of time. In order that the cost of the treatment may be kept to the lowest possible minimum, the accessory equipment must be simple in construction and capable of efficient and uniform operation without the necessity of providing especially trained or skilled labor. The equipment assembly and operation which least disturbs the usual routine of milk plant activities is obviously most desirable. Since the active radiations do not penetrate milk to any appreciable depth, 0.1 mm., and since the activation of the pro-vitamin is dependent upon direct exposure to the radiant energy, all particles of the milk must come in contact with the rays.

A certain portion of the antirachitic wave lengths, as well as longer wave lengths, are reflected from the milk surface.[6] The amount of such reflection is dependent upon the character and intensity of the radiations and angle of incidence. Suitable methods for the application of the energy and its uniform distribution must be provided in order to maintain a proper intensity of the incident radiations. This involves a determination of the distance from the source of energy to the milk film, and the use of reflectors of predetermined design and placement. These observa-

tions will serve to illustrate that the mechanics of milk irradiation from a commercial point of view involves more than an incidental and promiscuous exposure to ultra-violet rays. Such determinations are of importance in so far as they permit progress in the standardization and synchronization of the operating details necessary for the uniform production of a dependable and satisfactorily activated milk suitable for commercial distribution. The industrial irradiation of milk not only demands a simple and inexpensive method based upon specifications, but the results must meet the requirements of a critical clientele; the treated product must be acceptable to the public and its enhanced nutritive properties must be measurable in terms of benefit to the human subject and not solely in terms of laboratory assays.

A commercial method has been developed wherein these results are achieved. The method has been subjected to the crucial test of nearly 6 years' continuous operation in a commercial milk plant.[7, 8] The basic features mentioned, as well as others of equal or greater importance, have been embodied in this unit, having a normal capacity for the treatment of slightly more than 5,000 quarts of milk per hour. The milk is exposed uniformly in the form of a moving film which receives the rays at constantly changing angles of incidence, varying from 0 to 90°. The cycle of exposure to this range of impingement angles requires approximately 0.3 seconds. The thickness of film is maintained at substantially 0.4 mm.; the time of exposure does not exceed 16 seconds. In addition to the arc lamps and electrical accessories the equipment is similar to that common in many milk plants. Carbon arcs of the flaming arc type are used. Synchronized units for which standard data have been determined may be assembled with a capacity of as low as 625 quarts per hour; larger units may be assembled in any multiple of this minimum, and operated with equivalent efficiency.

The intensity of the radiations applied per unit of time is of paramount importance in determining the degree of antirachitic potency. A high intensity or a high rate of energy input per unit of time is necessary, not only for obtaining a satisfactory degree of potency, but also for the prevention of deleterious secondary reactions. Extended investigations[6, 7, 8] have shown that the synthesis of the antirachitic factor in milk is practically instantaneous, providing a suitable quality and quantity of radiant energy is used in conjunction with a perfected mechanism permitting an exposure of the pro-vitamin to such energy. In contrast with this, the development of objectionable features requires a time factor of greater duration than that required for antirachitic activation. The development of adverse manifestations is due primarily, if not solely, to an extended exposure, rather than to specific wave lengths within the now known antirachitic range. The practical significance of these observations is that with suitable radiations of sufficiently high intensity the conversion of a relatively large proportion of the antirachitic pro-vitamin takes place before other secondary reactions are manifested.

Various sources of radiation are capable of yielding a suitable quality and quantity of energy for the activation of milk under the conditions described. However, those sources from which the energy emission is constant and least subject to external influences, are to be preferred. Certain carbon arc sources are particularly suited to meet commercial requirements.[7, 8, 9] The carbon arc is of such a nature that under constant electrical conditions, namely, constant current and voltage of the arc stream between electrodes of a

given composition, a constant amount and quality of radiation is emitted. This radiation is constant irrespective of variations of a transient nature, and is also free from any alteration due to age of the lamp, since the electrodes when consumed are replaced. The radiation from such sources is as constant as the electrical conditions of the arc, which are in turn controlled by a motor operated mechanism which maintains substantially uniform electrical characteristics at the arc. The amount of energy supplied to the carbon arcs may be varied between wide limits by controlling the electrical characteristics of the lamp circuit, so the quantity of radiation from a given arc may be readily controlled since the amount emitted is a known function of the power consumed, and the kind of radiation may likewise be controlled by several methods. The chemical composition of the electrodes can be altered by adding inorganic substances to the carbon, which procedure is capable of providing wide variations in the character of the visible and ultra-violet radiation.[10]

Uniformity of treatment, and particularly uniformity in the amount and character of the applied energy, removes much of the misapprehension due to the early experiments in which unknown and uncontrolled amounts were applied. The amount of energy from any given source may now be determined practically during irradiation. An adaptation of the photo-electric cell has been developed, both as an indicating and recording ultra-violet ray meter,[11] which may be used in much the same manner as the recording thermometer in pasteurization.

Under the conditions described, substantially the entire degree of antirachitic potency which can be imparted to milk is produced almost instantly, or within a very few seconds, and destruction of vitamin A is insignificant or even immeasurable.[12, 13] Vitamin C may be slightly affected, but such destruction as has been observed is of no greater consequence than the inherent variations in the vitamin C content of non-irradiated milk.[14] The natural flavor of the milk is not impaired or affected to a degree which renders it objectionable. Laboratory and clinical results have proved that such milk either in fluid or dry form prevents rickets in infants and that it also has curative value in many instances.[7, 9] A definite relationship between the amount of energy applied and the rickets preventing properties has been proved in controlled laboratory studies with chickens.[15] The degree of potency of the milk required for the prevention of rickets in chickens and infants is not substantially different when calculated in terms of vitamin D required per unit of weight.

A recent report by Hess and Lewis[9] seems to demonstrate the practical possibilities offered by milk irradiated and otherwise handled under the usual conditions of commercial practice.

Space does not permit extended quotations from numerous clinical records showing the merits of irradiated milk in the cure and prevention of rickets. The favorable character of such results is the foundation upon which the development of practical and economical methods for the production of irradiated milk has been predicated. The additional cost is only about 1/25 cent per quart. In view of the prevalence of infantile rickets and its acknowledged preventability by suitable dietary and environmental conditions, the potential function of irradiated milk as an agency for the suppression and elimination of this disease is a matter of more than academic interest.

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LEONARD M. WACHTER

LEONARD M. WACHTER, Sanitary Chemist in charge of the Laboratories for Sanitary and Analytical Chemistry in the Division of Laboratories and Research of the New York State Department of Health, died at his home in Albany, on January 31, at the age of 59.

Mr. Wachter, who was born at Green Island near Troy, studied chemistry at the Rensselaer Polytechnic Institute, and in 1899 entered the service of the City of Albany as chemist, in charge of the water filtration plant. His association with the State Department of Health began in 1906 when he was appointed sanitary chemist in the Hygienic Laboratory.

Mr. Wachter's reputation as an expert sanitary chemist in connection with water purification and sewage treatment led to his participation in a number of projects of major importance. Early in his career, he was called upon to assist in the experimental work necessitated by the famous "Chicago Drainage Canal Case" in which the State of Missouri brought suit on behalf of the City of St. Louis against the State of Illinois and the Sanitary District of Chicago. Later he was active in the investigation of the pollution of the Niagara River; also, in coöperative studies to determine the efficiency of different types of milk pasteurization; and in other problems connected with the effective sterilization of horse hair, and the proper treatment and handling of oysters.

Mr. Wachter has been a member of the A.P.H.A. since 1906, and a Fellow since 1922. He had served as Chairman of the Laboratory Section, also as a member of the Council, and, since 1924, on the Standard Methods Committee of that Section. His other affiliations included membership in the American Water Works Association, the New York State Sewage Works Association, the Phenol Committee of Ohio River and the Great Lakes Boards of Engineers, and the New York State Association of Public Health Laboratories.

Production of Antirachitic Milk by the Feeding of Dairy Cattle*

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MILK has few defects as a perfect and complete food; it more nearly satisfies the requirements of complete nutrition than does any other single food product. The recognition of the defects of milk, and the character of these, constitutes an interesting chapter in the biological chemistry of recent years. It is known from chemical analysis that good milk contains excellent—if not optimum—proportions of protein, fat and carbohydrates, and of calcium and phosphorus; but it has taken the newer bio-assay methods to evaluate milk on the basis of its content of essential biologic factors such as vitamins, and certain mineral elements such as iron and copper.

A few years ago the evaluation of food products as to available nutrients was largely a matter of chemical analysis and calorimetry. It has been appreciated only within recent years that two bottles of milk—identical in composition according to the usual chemical tests—can be widely different in nutritive values. The idea and the ideal of "building" a milk of optimum biologic value is relatively new. While the use of various supplements to make up for the deficiencies which commonly occur in modern dietaries may be satisfactory, we feel that it is well worth while to make our common foods nutritionally more complete. It has been said by a leading authority on nutrition that "the place to get vitamins is in the market, in the grocery store, from the milk man, and from the garden, and not from the drug store." The one exception to this has been in regard to vitamin D, which occurs in most common foodstuffs in only very limited amounts.

It was recognized that the composition of cow's milk with respect to its content of proteins, fat, lactose, and some of the minerals, is largely under physiological control and not appreciably influenced by the feed of the cow, although with respect to some of the vitamins and other less known biologic factors, milk does show considerable variation, depending upon the feeds furnished the cow, and there is thus introduced seasonal fluctuations in the nutritive and biologic character of the product.

Beginning in 1925, studies on the nutritional qualities of our milk have been made continuously in the laboratories of the Department of Chemistry of Columbia University. The vitamin A, B, (B_1), C and G (B_2) values were determined at all seasons of the year. The results "indicate that a milk which is produced under excellent conditions of stall-feeding is a uniform and good source" of the vitamins mentioned.[1, 2]

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Fraps and Treichler [3] found that "the butter fat from cows fed cottonseed meal and hulls, at the end of 15 to 16 months contained about 2 units of vitamin A to the gm. Cows fed silage, in addition to the cottonseed meal and hulls, produced butter fat containing about 2 to 12 units of vitamin A to the gm.; cows having access to a pasture in addition, produced normal butter fat containing about 33 units of vitamin A to the gm." On a comparative basis, the stall-fed cows referred to [2] produced butter fat containing from 33 to 50 units of vitamin A per gm.

STUDIES ON INCREASING VITAMIN D IN MILK

It was recognized that all milks as ordinarily produced are relatively poor sources of vitamin D. This is true of the various species, including man. It was decided to investigate the practicability of increasing the antirachitic potency of cows' milk by feeding vitamin D-rich supplements.

In 1924, Luce [4] reported that the diet of the cow appeared to be the main factor in determining the antirachitic potency of her milk. Wagner [5] in 1926, found that cows fed for 7 months with large doses of cod liver oil produced milk with no appreciable corrective properties for rickets in infants. Feeding cod liver oil is not a practical method of increasing vitamin D because of the marked depressing effect upon the fat content. In 1929, Wachtel [6] showed that the vitamin D may be increased by feeding irradiated yeast. In 1930, Steenbock and his coworkers [7] reported that they had been able to increase the vitamin D by feeding 50 gm. of irradiated yeast daily.

Our first experiments were started in April, 1930. Both irradiated yeast and irradiated ergosterol were fed and compared as sources of vitamin D for dairy cattle. Three groups of cows were fed different levels of irradiated yeast; 3 groups were fed irradiated ergosterol; and 1 group served as controls. The experiment extended over a period of 4 months.

At the end of this period, samples were collected from each group, and the butter fats separated and tested for their vitamin D potencies. The results have been reported by Thomas and MacLeod.[8] It was found that the highest levels of irradiated yeast and of irradiated ergosterol both increased the vitamin D potency of the milk to 16 times that of milk from cows receiving no supplement.

The results of this preliminary work seemed so promising that it was decided to repeat some phases of it and to subject the activated milks to critical clinical tests. In December, 1930, another experiment was started in which the supplements mentioned were again used. Since the milk was to be used over a prolonged period for baby feeding incident to the clinical trials, larger groups of cows were required. The cows were selected so that the milk from each group of 8 tested as nearly 4 per cent butter fat as possible; "master" rations containing the vitamin D supplements were prepared with exactness; a special man was detailed to insure proper feeding of the groups and a group of replacement cows was maintained so that any animal in the experiment could be replaced if necessary. In all, 50 cows were included in the investigation.

The results of this experiment, which confirmed those of the first, are summarized in Table I.

It will be noted that the groups (F and Y) receiving the higher levels of irradiated ergosterol and of irradiated yeast produced milk the butter fats from which showed potencies 32 times as great as those from the control group. This gives a milk containing approximately 160 units of vitamin D per qt. of 4 per cent milk.

CLINICAL INVESTIGATIONS

The second experiment was planned so that clinical tests on the milk could be carried out. It was recognized that such tests were essential to determine the practical value of the milks so produced.

Tests were started in New York City early in January, 1931, by Hess and his associates. The milks from the 4 groups in the experiment described (Groups E, F, X and Y, Table I) were fed to 102 infants (about 25 in each group) as their only source of vitamin D. The test was essentially prophylactic, but some of the babies showed evidences of rickets at the beginning, so that it served as a curative test as well. The infants were examined, physically and by X-ray, before, during and at the end of the test, and were under close observation at all times.

Hess and his coworkers reported the results in June, 1931,[9] and stated that "of the four test milks, all except the weaker 'yeast milk' were found, almost without exception to prevent as well as to cure rickets." It was pointed out that by the use of the specially activated milk, the specific antirachitic factor is incorporated in the diet, thus functioning automatically and relieving the physician of dependence on the mother for administering other antirachitic agents.

It was considered advisable to carry as many babies as possible through the summer and second winter. This was done in order to answer possible questions relative to the effects of milk with high vitamin D content taken during the summer months, and also to be sure that such milks would be fully effective over prolonged periods. Accordingly, about half the babies were continued on the test until April, 1932, making a total of 15 months during which they received the special milks from the groups of cows receiving the higher levels of irradiated yeast and of irradiated ergosterol (Groups F and Y, Table I) as their only source of vitamin D.

Hess and Lewis state[10] that these infants thrived, did not develop rickets in the second winter, and that the bones showed excellent calcification on roentgenologic examination.

At the same time a clinical test was undertaken in Boston by Wyman and Butler at the Infants' and Children's Hospital. A group of cows was selected and specially fed on the higher yeast level, i.e., 60,000 units daily per cow, at the Walker-Gordon farm at Charles River, Mass. The milk was used as a curative for rickets rather than as a prophylactic. Four cases of advanced active rickets were selected, carefully examined as to physical, X-ray and blood chemistry findings, and were hospitalized prior to and during the test. In all cases, the milk was pasteurized and, in one case, was boiled for 5 minutes in addition.

Wyman and Butler conclude[11] that the milk used "was an effective source of antirachitic substance as determined by its ability to cause healing in advanced active rickets in infants and advanced chronic rickets in children. After 5 minutes' boiling the milk still possessed antirachitic properties." Also "the substitution of this milk for the ordinary milk in the formulas of infants would introduce an effective prophylactic and curative agent against rickets requiring a minimum of coöperation on the part of the mother." Incidentally, laboratory tests have also shown that pasteurization or boiling does not reduce the antirachitic values of milk produced by the supplement-feeding method.

EFFECT OF "VITAMIN D" MILK ON THE ANTIRACHITIC POTENCY OF HUMAN BREAST MILK

The status of human milk in respect to its antirachitic potency is not clear. Although breast-fed babies are less sub-

TABLE I

Group	Supplement Fed	Rat Units of Vitamin D Fed Per Cow Per Day	Amount of B.F. Containing 1 Rat Unit—Grams	Relative Potencies
Control	none	.....	8.0	1
E	Irradiated Ergosterol	100,000	0.5	16
F	Irradiated Ergosterol	200,000	0.25	32
X	Irradiated Yeast	30,000	0.5	16
Y	Irradiated Yeast	60,000	0.25	32

ject to rickets than bottle-fed babies, nevertheless the milk of the nursing mother ordinarily contains little, if any, of the antirachitic factor as determined by the rat test. Breast-fed babies require less of the antirachitic factor as we usually think of it than babies fed cows' milk.

An interesting test has just been completed at the Florence Crittenden Home in Boston, in which a group of nursing mothers were fed vitamin D milk. Samples of breast milk were obtained, pooled, and bio-assayed, and compared in potency with control samples of breast milk from mothers taking no antirachitic supplement. Bunker, Harris and Eustis [12] show that an appreciable increase in antirachitic potency of human breast milk takes place when vitamin D milk is included in the diet of the mother during lactation. They point out that this is a simple and acceptable manner of augmenting the antirachitic potency of human breast milk.

We believe that vitamin D in the diet of the mother should also have a special value as a protection against the depletion of calcium and phosphorus from her body which may occur during pregnancy and lactation.

PRODUCTION OF ANTIRACHITIC FLUID MILK

The experiments briefly recounted here have involved a number of considerations of great fundamental importance in practical application. These include the selection of a suitable antirachitic supplement for feeding the cows, the desirable potency to be attained in an antirachitic milk, the maintenance of uniform potency, the potency of and amount of supplement to be fed, the effects of prolonged administration of vitamin D-rich supplements on the health of dairy cattle, adequate control methods to insure reliable potency, and so on. Fortunately the experiments were so set up that the answers to many of these questions were readily obtained; special studies have been and are being made to answer others. The data brought out by Thomas and MacLeod in the experimental work with cows, by Hess and by Wyman and their associates in the clinical studies have served as the basis of methods and standards for the production of antirachitic fluid milk by the supplement-feeding method.

VITAMIN D SUPPLEMENTS FOR FEEDING DAIRY CATTLE

So far, the results indicate that irradiated dried yeast of known potency is the supplement of choice. It is easily incorporated in the grain ration by thorough mixing to insure uniform distribution. As noted by Thomas and MacLeod, some antirachitic supplements may be utilized more efficiently than others by the dairy cow (Table I). On the basis of total rat units fed, irradiated yeast proved approximately 3 times as effective as irradiated ergosterol in producing milk of a given potency. The fact is clearly indicated by the data cited, but doubtless there are various factors for which allowance must be made before final conclusions are drawn.

AMOUNT OF YEAST IN RELATION TO POTENCY OF MILK

In the clinical tests made by Hess and his associates, the results indicated that

a desirable potency was present in those milks which on the basis of bio-assays, contained approximately 160 rat units of vitamin D per qt. This potency was effective in preventing and curing rickets in babies and children, the curative effectiveness being especially well demonstrated in the cases reported by Wyman and Butler.

Subsequently, 150 to 160 rat units of vitamin D per qt. of milk has become generally accepted and adopted as the standard of potency. To obtain this and keep it uniformly reliable requires careful supervision over a number of factors. Obviously, the first requirement is a yeast of known and standard potency. The manufacturers (Standard Brands, Inc.) have developed methods whereby a standardized product having a definite minimal antirachitic potency is available. The potency of this yeast is approximately 30-D and contains about 400 rat units per gm.

The dry powdered yeast is preferably incorporated into the grain ration, and thoroughly mixed to insure uniform distribution. This system insures more or less automatic and regular feeding of the yeast, and provides automatic adjustment of the amount fed to the requirements of the individual cow, since it is good dairy practice to feed grain in proportion to the amount of milk produced, and it is known that the yeast requirement for a given potency of the milk is proportional to the amount being produced. This has been determined by results obtained on individual cows, reported by Hess and associates [13] and by results on milk for a number of herds reported by Frey and Light.[14]

In deciding how much yeast must be incorporated in the grain mixture to give a certain potency to the milk, the two main considerations are (1) the amount of grain being fed, and (2) the amount of milk being produced. Frey and Light of the Fleischmann Laboratories [15] have drawn up the following formula:

$$\frac{Q \times 160}{X} \times \frac{100}{454} \times \frac{1}{F} = \text{per cent of yeast to be included in the grain concentrate}$$

Q equals total quarts produced by all cows to be fed yeast

X equals For 45 lb. production — 9.2
For 37.5 " " 8.7
For 30 " " 8.4
For 25 " " 7.9

F equals total lb. of grain fed to all the cows to be fed yeast

This formula is based on a required potency of 160 units of vitamin D per qt.

Such a formula serves essentially as a guide and does not take into consideration all of the known or unknown factors involved. It is known that feeding 3 times daily gives better results than twice daily and, twice daily is more satisfactory than once a day. Whether or not the desired results are being fully attained can be determined only by bio-assays on the milk. Frey states [15]: "We are confident, as the result of a large amount of experimental work, that once the proper level has been reached—in other words, 160 Steenbock units per quart—it will not be necessary, provided the cows are kept under the same conditions, to test the milk each month. We believe that the feeding if accurately done, is sure to produce the desired potency in the milk."

Another point is the fact brought out by Russell [16] that it takes about 20 days after yeast feeding has started before the milk reaches its maximum potency.

The cost of the yeast, calculated on the basis of 6/10 lb. per day for a cow producing 15 qt. of milk, at the present price amounts to about 1 cent per qt. In addition there is a fee for a license to use the yeast, and the expense of making such tests on the milk as may be required.

EFFECT OF CONCENTRATED VITAMIN D SUPPLEMENTS ON THE HEALTH OF COWS

It was considered important to note the effects of feeding concentrated vitamin D on the health of the cows. This has been done both with the experimental groups and with those that are used in the commercial production of antirachitic milk for general distribution; our cows are under constant observation as to general health, appetite, and production of normal milk, and they have daily veterinary supervision. The general health of the animals has at all times been excellent over a period of more than 1½ years. There has been no detrimental effect on the productiveness of the cows and the physical character and taste of the milk remain unaltered.

We have coöperated in an experiment in which excessive amounts of irradiated yeast and irradiated ergosterol have been fed to groups of cows for several months. This was undertaken to hasten and intensify any pathologic conditions that might result from prolonged administration of vitamin D supplements. The results [13] may be summarized as follows:

In cows fed about 10 oz. daily of irradiated yeast—

> . . . no increase in the phosphorus, calcium or ash (of the milk) was found, nor was there an increase in the inorganic phosphorus or calcium content of the serum.
>
> When excessive, non-therapeutic, amounts of irradiated ergosterol were fed, a slight but definite rise in the calcium, phosphorus, and ash content of the milk resulted; these increases were less in the milk of cows which secreted a large volume of milk daily. There was also a rise in the concentration of calcium in the serum and, especially, of phosphorus.
>
> Histological examinations of the various organs of the cows which received excessive amounts of irradiated ergosterol for long periods failed to show any lesions of the cellular structure or of the blood vessels. Analysis of the ash of the bones showed the percentages to be within normal limits.

RELATIVE EFFECTIVENESS OF ANTIRACHITIC MILKS

One of the striking observations incident to the studies reviewed here, and referred to in another report on activated milk [10] is the rather remarkable antirachitic effectiveness of such milks when compared, on the basis of rat unit potency, with other antirachitic agents such as cod liver oil and viosterol. On the basis of the number of rat units present, vitamin D milk as we have described it is more effective than either of the other two substances. As pointed out by Hess,[8] the ratio is, 1:1.25:5.2. This means that 1 qt. of this milk, representing 160 units, has the efficiency in preventing rickets of 15 c.c. of standard cod liver oil (200 units) or of 10 drops of viosterol (830 units). It may be well to repeat that milk has excellent proportions of calcium and phosphorus, the very mineral essentials which are mobilized by the antirachitic factor, and other biologic factors present in milk of high quality may lend special potency to the product.

SUPERVISION

It is apparent that the supervision and control of antirachitic milks produced as described here, or by any other method, are matters for consideration by health authorities and food control officials. It is of the utmost importance that the production of such special milks be surrounded with adequate safeguards to protect the consumer and to prevent the marketing of sub-standard products which might reflect discredit upon qualified products. Some progress has already been made in this direction. The Wisconsin Alumni Research Foundation exercises legal control over the irradiation of various products, including yeast, for the feeding of animals. It requires a license to dairymen who wish to produce vitamin

D milk by feeding irradiated yeast, which stipulates conditions under which the yeast may be used and provides steps by which the potency of the milk produced may be controlled.

We recognize the necessity for periodic bio-assays to check the potency of vitamin D milk. These may be made in official laboratories, or in other recognized and competent laboratories under official sanction. In the case of certified milks, the methods and standards provide that the production of antirachitic milk shall be subject to the approval of the local authorities and the medical milk commissions. In one instance, the research division of a large city department of health has developed a laboratory where official bio-assays will be made. It is anticipated that the results of tests made in that laboratory will serve for a number of local medical milk commissions and the department of health, so that duplication of tests and unnecessary expense will be avoided. Also there are two qualified institutional laboratories, besides the University of Wisconsin, which are in a position to make routine tests for control.

The experience required for making reliable bio-assays for vitamin D, the relative scarcity of laboratories qualified for this kind of work, and the expense of a single test, are factors which make the routine control of antirachitic milks a problem for careful consideration. The problem is simplified somewhat by the fact that the potency of these milks can be controlled within reasonable limits by the method of production. The bio-assays must serve as a check on the efficiency and integrity of the producer. The application of these methods must be considered as in the developmental stage, requiring the interest and help of all who would like to see milk made more complete in biologic values.

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NOTE: *This is the last paper of the Symposium on Milks of Special Antirachitic Value. Other papers appeared in the Journal for December, 1932, and January, 1933. The Report of the Committee on Milk and Dairy Products will appear in the Year Book.*

Relationships of Leucocytes and Streptococci to Fibrosis of the Udder*

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THE significance of the presence of long-chained streptococci and cells in milk has long been a problem for milk control officials who are interested in detecting udder infections. The problem has received considerable attention by various investigators who have studied the flora of the so-called "normal" udder in an attempt to determine definitely the types of streptococci harbored in udders that are apparently normal to the casual observer. In many instances also the cell content of the milk has been studied in an effort to learn whether milk from udders which have been considered normal in most respects contain an appreciable number of cells. In such investigations milk has been selected which was normal in appearance and from cows which to all appearances were normal.

It has been pointed out by Udall and Johnson (1930) that cows may give milk that is regarded as normal although the udder may show signs of infection in the form of indurated tissue. This indurated or fibrotic tissue which is thought to be a result of the breaking down of the glandular structure and its replacement by white fibrous tissue, imparts hardened areas to the udder which may be detected by manual examination. It has been assumed that individuals showing this scar tissue have at some time been infected, and that these indurated or fibrotic conditions found upon physical examination are the result of this infection. Certain investigators believe that once a quarter has been infected and these indurated areas developed, the quarter will never become entirely free of the infection. Under such conditions the infection is liable to re-occur at certain intervals. Other workers have preferred to believe that this scar tissue is only the result of an infection. Under such a condition it would be possible for an infection to run its course and the udder become entirely free from the invading organism and its effects, viz., leucocytes, the scar tissue remaining as an inert evidence of the breaking down of the secreting tissue. If this view is correct, the presence of scar tissue would have little significance as a means of detecting cows in a herd that may harbor infection and serve as foci of infection of the entire herd. Under such conditions scar tissue must be interpreted as meaning that the cow either is or has been infected.

On the other hand, if it is found that once a cow is infected the infecting organism always remains in the udder awaiting the proper condition for a subsequent attack upon the tissues, the presence of scar tissue becomes an important criterion for detecting cows with chronic mastitis. The question resolves itself into a study of the significance of the indurations. Does a

* Read before the Laboratory Section of the American Public Health Association at the Sixty-first Annual Meeting in Washington, D. C., October 25, 1932.

fibrotic condition indicate a circumscribed lesion or rather a mass of inert white fibrous tissue which may contain no evidence of an infecting organism?

It has been pointed out by Hucker, Trudell and Jennings (1932) that all studies pertaining to udder flora and the constituents of milk should be carried out by using milk known to come from cows which have been subjected to a careful physical examination. If the results are to be considered as studies of milk from "normal" udders or udders known to be free from previous infections, these normal udders should be found to be free from fibrotic tissue.

The purpose of the present investigation has been to learn the relationship between the presence of cells and streptococci in milk and the presence of indurations or scar tissue in the udder.*

METHODS

Regular weekly quarter samples of milk from approximately 150 cows have been examined by the methods outlined by Hucker, Trudell and Jennings (1932) over a period of 10 months. The udders from which these samples have been secured have been examined at irregular intervals for the presence of white fibrous tissue, by the methods proposed by Udall and Johnson (1930). Such a routine not only gave information regarding the flora and leucocyte content of the milk but the pathological condition of the udders.

DEFINITION OF TERMS

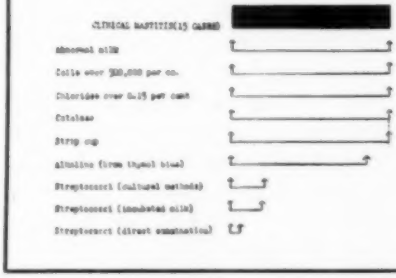
As pointed out by Hucker, Trudell and Jennings (1932) two types of mastitis are recognized based upon external evidences, viz., clinical and sub-clinical. The clinical type, referred to by many as active or acute, is relatively rare and involves an extreme toxic condition with occasional systemic disturbances. In sub-clinical (latent, chronic) type the individual may appear normal in most respects but the milk reacts in varying degrees to laboratory tests for mastitis and demonstrable scar tissue appears in the udder. Although the sub-clinical type may become more acute at certain intervals the condition never assumes the extreme conditions noted in clinical mastitis. In aggravated cases of sub-clinical types the milk may become broken down with little evidence of toxemia in the individual.

DATA

THE EFFICIENCY OF THE VARIOUS LABORATORY TESTS IN DETECTING CLINICAL MASTITIS

Clinical Mastitis—The condition of the individual suffering from acute mastitis is so obvious that no tests are required for its detection. If milk can be obtained from the affected quarter it is (Figure I) always broken down with either a watery or serous appearance. The reaction is pH 6.9 to 7.4 and the catalase content is high while the amount of chlorides is always above normal.

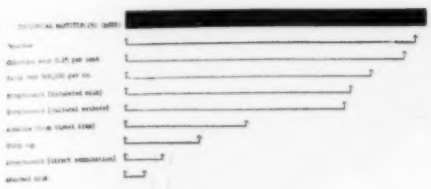
FIGURE I—EFFICIENCY OF VARIOUS TESTS UPON MILK TO DETECT MASTITIS



It is only with difficulty that organisms can be isolated from the secretion of the infected quarter. Direct

* It is realized that voluminous literature exists dealing with the relationship of leucocytes and streptococci in the udder and their significance in udder infections. A complete bibliographic review is being prepared and will subsequently appear. For a complete published discussion of this subject reference should be made to Breed (1914).

FIGURE II—EFFICIENCY OF VARIOUS TESTS UPON MILK TO DETECT MASTITIS



microscopic examination, even of samples previously incubated, rarely reveals long chained streptococci, while cultural methods add little more possibility of isolating organisms.

THE EFFICIENCY OF CERTAIN LABORATORY TESTS IN DETECTING SUB-CLINICAL MASTITIS

The relation of fibrous tissue in the udder to the presence of cells in the milk—The significance of cells in milk has received considerable attention. Breed, after a detailed study of a series of cows, concluded that there were several unknown factors that may influence the number of cells in milk and that care should be taken in interpreting the significance on their presence in milk.

In the present investigation (Table II, Figure III) it has been found that over a period of 10 months no quarter that was free of indurations or fibrotic tissue discharged at any one time more than 150,000 cells per c.c. On the other hand, even this number were found in only one isolated instance. Ninety-nine per cent of the normal quarters, *i.e.*, quarters free from scar tissue, showed less than 60,000 cells per c.c., while a great majority, viz., 87 per cent, never gave a higher count than 30,000 cells per c.c.

On the other hand, 63 per cent of the quarters showing fibrotic tissue gave milk showing more than 150,000 cells per c.c. It is also interesting to note that 73 per cent of the quarters with a marked fibrosis showed over 500,000 cells per c.c. in the milk.

Hucker, Trudell and Jennings (1932) have pointed out that all quarters showing a cell count greater than 3,000,000 per c.c. give definite evidence of infection. From the results of the present investigation it is safe to conclude that all quarters showing cell counts of more than 150,000 per c.c. should be considered as suspicious, if not definitely proved to be infected with streptococci.

It was also found that not all quarters

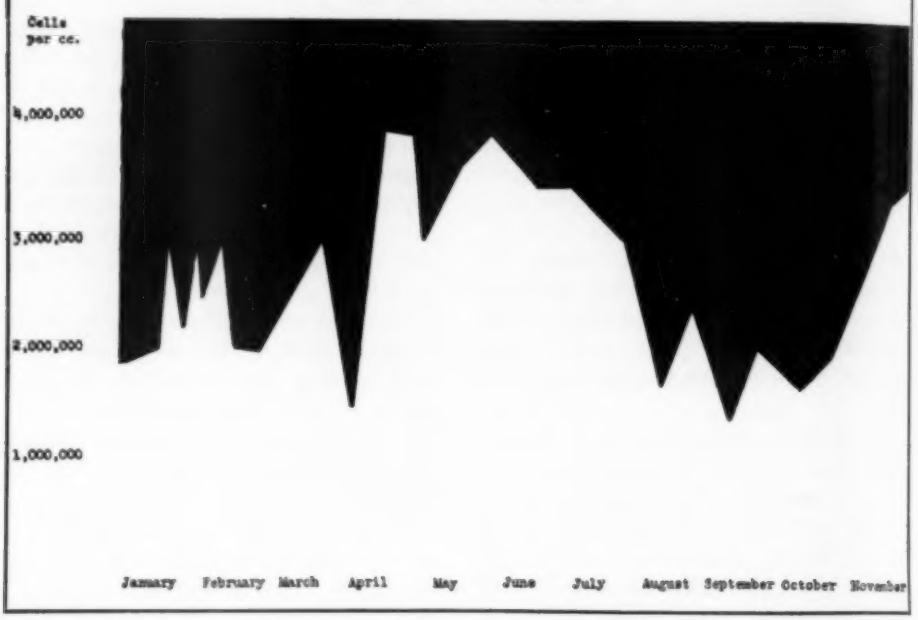
TABLE I

RELATION OF NUMBER OF CELLS PER C.C. IN MILK TO THE PRESENCE OF FIBROSIS IN THE UDDER

Amount of fibrosis	Number of quarters studied	Number of tests on each quarter	Per cent showing cells per c.c.						
			Less than 30,000	30,000 to 60,000	60,000 to 150,000	150,000 to 300,000	300,000 to 1,000,000	1,000,000 to 5,000,000	More than 5,000,000
Absent	63	20	87	12	1	0	0	0	0
Slight	68	20	60	3	7	9	7	9	5
Distinct	109	20	25	5	7	11	19	25	8
Marked	24	20	22	5	0	0	18	34	21

Total tests = 5,080.

FIGURE III—MINIMUM NUMBER OF CELLS PER CUBIC CENTIMETER IN MILK FROM 124 "HIGH CELL COUNT" QUARTERS



which show white fibrous tissue discharged an appreciable number of cells. About 25 per cent of the quarters classified as showing distinct or marked fibrosis failed in any instance out of a series of examinations extending over 10 months to show cells in a greater number than 30,000 per c.c. It seems evident that there are two distinct groups of fibrotic quarters, one which never throws off cells and one which constantly, over a long period, will give milk in which the cell count is relatively high. At present it is safe to conclude that cell counts in excess of 150,000 per c.c. are always from quarters which show some degree of fibrosis. However, not all indurated quarters give excessive cell counts.

It has been further observed (Figure III) that once a quarter begins to throw off a large number of cells in the milk the numbers of leucocytes remains relatively large for months or even longer. Over a period of 10 months of observations on so-called "high count" quarters the minimum number of leucocytes never dropped below 1,000,000 per c.c. In other words, once a large number of leucocytes appear in the milk from any quarter, they rarely diminish.

The same observations were true regarding the milk containing a small number of leucocytes. The maximum (Figure IV) number found in the milk from quarters evidencing no scar tissue when studied over a period of 10 months, never exceeded 200,000 per c.c. The individuals remained over the entire test period as "low cell count" cows.

A certain amount of variation (Figure V) between the leucocyte content of the milk from the 4 quarters of the same individual was noted. One of the most interesting observations in this connection was the fact that a greater variation could be found in the milk from quarters showing an excessive number of leucocytes than milk containing a minimum number.

TABLE II

RELATION BETWEEN H-ION CONCENTRATION OF THE MILK AND THE PRESENCE OF FIBROSIS IN THE UDDER

Amount of fibrosis	Number of quarters studied	Number of tests on each quarter	Per cent showing reaction with Brom thymol blue							
			Light green		Blue green		Blue			
			pH 6.6	pH 6.7	pH 6.8	pH 6.9	pH 7.0	pH 7.1	pH 7.2	pH 7.4
Absent	60	20	95	5	0	0	0	0	0	0
Slight	70	20	81	11	1	3	0	0	0	4
Distinct	85	20	80	3	7	6	0	0	0	4
Marked	22	20	44	5	6	4	9	13	8	11

RELATION OF FIBROTIC TISSUE TO THE BROM THYMOL BLUE TEST

For some time the brom thymol blue test has been used in detecting cows that are infected and that should be classed as having mastitis. Its widespread use has raised many questions of interpretation of the results secured.

In ordinary use the results secured by this test have been classed in three groups, viz., light green, which includes the cows giving normal milk, blue green or the suspicious cows, and dark green which always signifies abnormal conditions. Certain workers have endeavored to make finer distinctions and interpret the results as H-ion readings. The latter although applicable in the laboratory is not recommended for practical barn use.

The results of the present investigations (Table II) with the brom thymol

FIGURE IV—MAXIMUM NUMBER OF CELLS PER CUBIC CENTIMETER IN MILK FROM 112 "NORMAL" QUARTERS

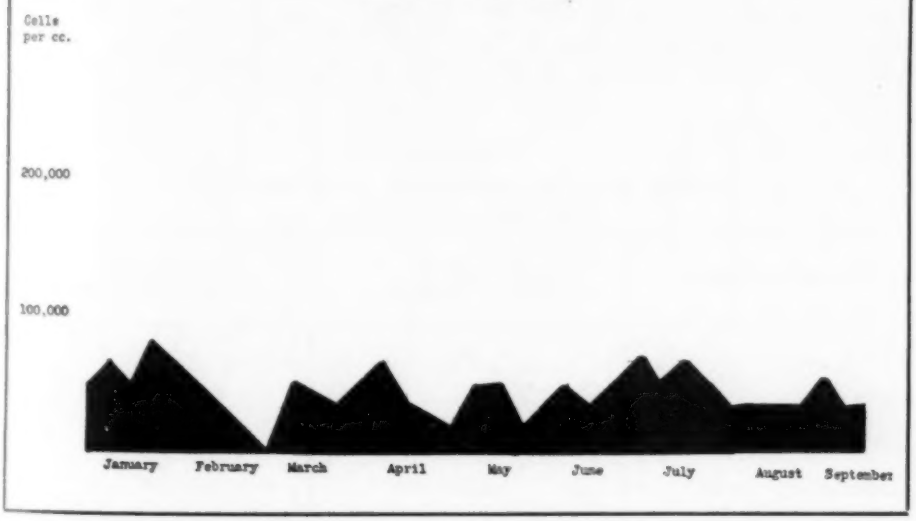
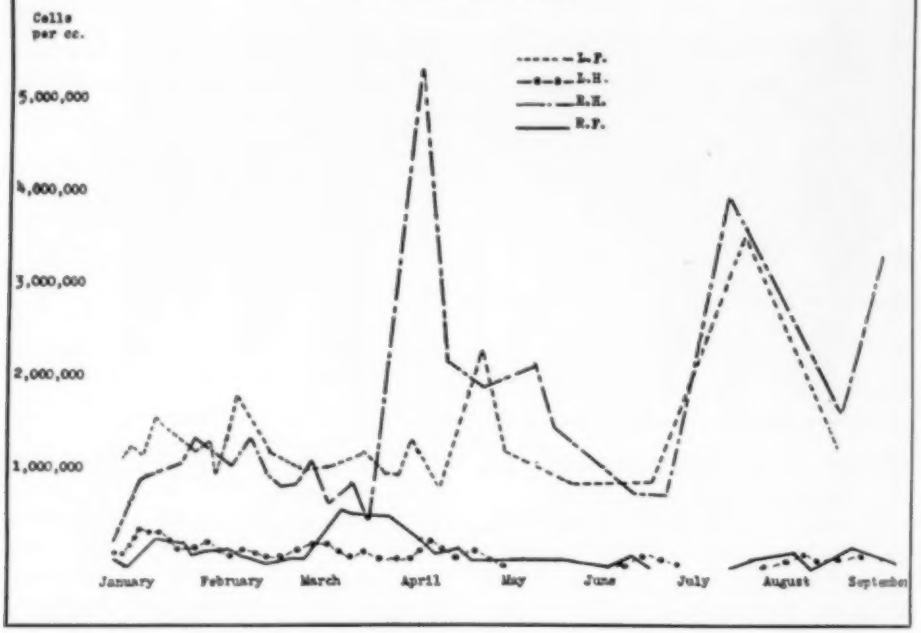


FIGURE V—VARIATION WEEKLY IN NUMBER OF CELLS IN MILK FROM 4 QUARTERS OF THE SAME INDIVIDUAL



blue test are very similar to those secured from a study of the cells and streptococci present. In no instance during the 10-month study did a quarter free of indurated tissue give a positive reaction to brom thymol blue, though not all of the indurated quarters gave positive reactions. It is concluded that a positive reaction by this test always signifies indurated tissue in the udder while fibrosis free quarters never show it.

RELATION OF FIBROTIC TISSUE IN THE UDDER TO THE PRESENCE OF STREPTOCOCCI IN MILK

A study of 264 quarters which extended over 10 months showed that only approximately 11 per cent were free from indurations or fibrotic tissue. The remaining 90 per cent showed affected tissue to some extent. The most interesting observation (Table III) in this connection is the fact that no streptococci were found during this

TABLE III

RELATION OF FIBROSIS IN THE UDDER TO THE PRESENCE OF STREPTOCOCCI IN THE MILK

Amount of fibrosis	Number of quarters studied	Per cent showing streptococci
Absent	30	0
Slight	76	5
Distinct	100	24
Marked	58	10

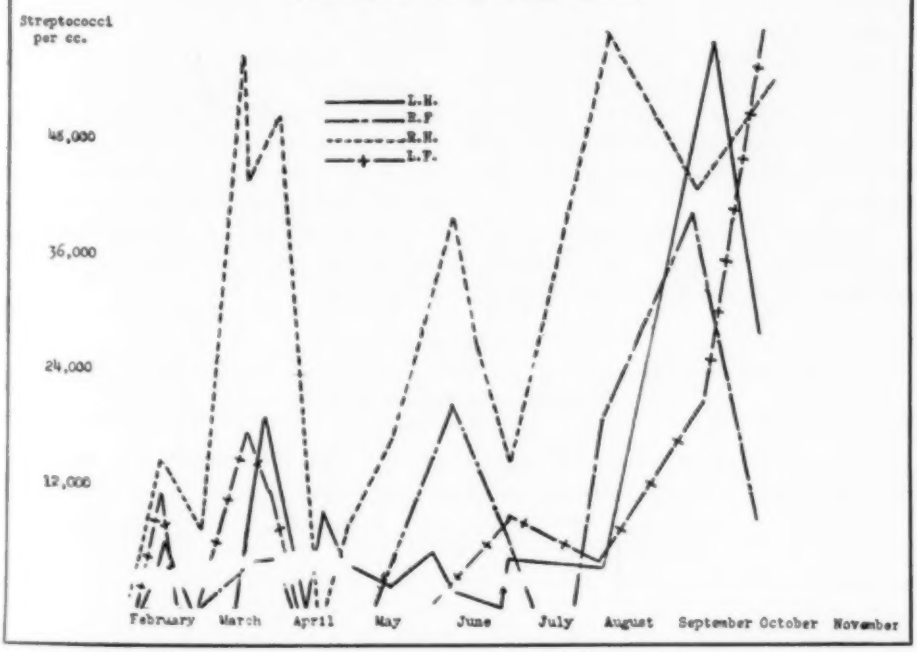
period in the milk from the quarters that were free of fibrotic tissue. The 30 quarters which by physical examination were found to remain pliable with no hardened areas or indurations were found to remain free of streptococci. From these results it appears probable that where previous investigators found streptococci in the freshly drawn milk an examination of the udder would have shown the presence of fibrotic tissue.

These observations raise the question of the nature of the so-called "normal" flora of the udder. Some workers have assumed that a certain number of streptococci are normal inhabitants of the udder. The above data, however, indicate that such is not the case if normal udders are those that are free from fibrotic tissue. On the other hand, the conclusion should not be drawn that all udders that show indurated tissues will throw off streptococci.

Of the 234 quarters that showed indurations on physical examination, only 39 per cent were found to discharge demonstrable streptococci in the milk. It is also of interest to note that, of the quarters which discharged streptococci, the milk from the majority contained streptococci in all samples, indicating that once streptococci are thrown off, the presence of these organisms is more or less constant. The indurated quarters in which no streptococci were found remained as free from these organisms over the period in which the observations were made as the quarters in which no fibrotic tissue was found. It is concluded that streptococci are found only in milk from udders that have developed fibrotic tissue. Not all indurated udders, on the other hand, eliminate streptococci.

The weekly variation in the number of streptococci in the milk from the four quarters of one individual was found to be excessive. It was noted that at certain intervals the milk from

FIGURE VI—VARIATION WEEKLY IN THE NUMBER OF STREPTOCOCCI IN MILK FROM 4 QUARTERS OF THE SAME INDIVIDUAL



a given quarter (Figure VI) was practically free of long chain streptococci while subsequent examinations showed relatively large numbers of them.

RELATION OF STREPTOCOCCI IN MILK TO THE NUMBER OF LEUCOCYTES

A study over 10 months of a composite sample of all four quarters of 133 cows (Table IV) has shown that 78 discharged consistently more than 500,000 cells per c.c. in their milk. A further study of these cows also showed that all contained streptococci at some period during this interval. On the other hand, of the 55 cows showing less than 500,000 leucocytes per c.c. only 4 showed streptococci at any time during these observations. In other words, if kept under observation the milk of cows eliminating large numbers of leucocytes will generally contain long chain streptococci at some period during lactation.

TABLE IV

RELATION OF STREPTOCOCCI TO THE NUMBER OF LEUCOCYTES IN MILK

Number of cows	More than 500,000 cells per c.c.		Less than 500,000 cells per c.c.	
	Streptococci present	Streptococci absent	Streptococci present	Streptococci absent
133	78	0	4	51

A study of the relationship of the simultaneous presence of cells and streptococci in quarter samples reveals somewhat different results than are found in the case of the composite sample. A study of 117 quarters which (Table V) showed a pronounced fibrosis revealed that 20 threw off more than 500,000 cells per c.c. and streptococci were not observed in the milk of any of these quarters.

Observations revealed that cows with one quarter discharging an excessive number of leucocytes will show streptococci in one of the four quarters some time during lactation. However, these streptococci are not always in the quarter showing the large number of cells. On the other hand, not all high cell producing quarters will throw off streptococci.

This peculiar relationship needs investigation to determine whether it is a fact or merely a coincidence.

A further interesting (Table V) observation is the fact that over a period of 10 months' observation 27 of these 117 quarters with pronounced fibrosis have shown neither cells nor streptococci in the milk.

TABLE V

RELATION OF STREPTOCOCCI TO THE NUMBER OF LEUCOCYTES IN MILK FROM QUARTERS WITH MARKED FIBROSIS

Number Of quarters	More than 500,000 cells per c.c.		Less than 500,000 cells per c.c.	
	Streptococci present	Streptococci absent	Streptococci present	Streptococci absent
117	47	20	6	27

CONCLUSIONS

1. Milk containing more than 500,000 cells per c.c. always indicates an abnormal or pathological condition in the udder.

2. Milk containing large numbers of cells will generally continue to contain excessive numbers while milk with a small number of cells rarely shows more than 200,000 per c.c.

3. Variation in number of cells per c.c. is greater in milk containing large numbers of cells than milk showing a smaller number.

4. Alkaline reaction to brom thymol blue is never obtained on freshly drawn milk from a fibrosis free quarter.

5. When streptococci are found in aseptically drawn milk, the quarter is always indurated.

6. All quarters free from scar or indurated tissues never show demonstrable streptococci or cells in excess of 150,000 per c.c. in the milk.

7. Not all indurated quarters show streptococci or a significant number of cells.

8. Milk from a normal quarter or free of fibrosis does not contain long chained streptococci or cells in excess of 150,000 per c.c.

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Meals for School Children—Yugoslavia

THE central committee of the Junior Red Cross of Yugoslavia has been active in establishing lunch rooms for school children, particularly in the villages where children live at long distances from school and do not receive sufficient food for lunch. Part of the necessary funds is provided by central and local committees of the Junior Red Cross on the condition that its members actively participate in the work of the lunch rooms and that they cultivate their own vegetable gardens, the products of which are used for the lunch rooms. Subsidies are also granted by the local government and by private relief agencies. A recent law on primary schools orders the establishment of lunch rooms in all village schools.—*Nouvelles de l'Union Internationale de Secours aux Enfants*, Geneva, Sept., 1932.

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YOUR ASSOCIATION

EVER since the organization meeting held at the New York Hotel on Friday evening, April 18, 1872, the American Public Health Association has played a leading part in molding the health organizations of our continent. The Annual Meetings have served for the contribution of reports and papers upon important sanitary questions, most of which are later published in the columns of this JOURNAL. This abundant harvest, rich in the researches and studies of our numerous committees and individual members, has furnished food to many a hungry sanitarian seeking the views of those of wider experience.

Health departments throughout the land are reporting new low death rates for 1932. Many are puzzled at these new low figures. Few of us stop to appreciate what an important contribution our Association is making by creating safeguards of human life which make possible these new health records. Undoubtedly many reasons will be given for the continued salubrious health conditions of 1932. Foremost among these causes stands forth the fact that we are still reaping the benefit of the health promotion activities which have been built up during the past two decades. Public health reflects collectively the health consciousness of the individual citizen. A community with a low diphtheria death rate is one in which the average mother has learned that every child beyond the age of 6 months should receive diphtheria protection. The absence of smallpox results from generous vaccination and revaccination. A low tuberculosis death rate means that the public has learned that this is a communicable disease and that tuberculosis comes from tuberculosis. Case-finding machinery, periodic health examinations, clinics, open air schools, hospitals and sanatoria have made their contribution, but health education is the foundation stone on which have been created community health facilities. The apparent increase in malnutrition reported from many sources offers a challenge to the health officer to fight strenuously for the maintenance of his organization. The progress of the past

and the hope for the future is in no small manner dependent upon our success in coherently maintaining our support and interest in the American Public Health Association.

Naturally, there are other factors which have contributed to the maintenance of good health. Nature has blessed us with relative freedom from such epidemic diseases as influenza, concerning the control of which we know so little. Progress in science and the development of new administrative and control procedures have been encouraged and furthered by the members and committees of this Association. There has never been a time in its history when the American Public Health Association was more deserving of the support of its membership. In spite of adverse circumstances the number of active members in 1932 showed little reduction over previous years. There is great need for concerted effort on the part of all of us to stimulate and maintain the whole-hearted support and interest of the health workers throughout the country. Do your share to stimulate this interest. Pay your own dues promptly and see that your neighbor does likewise. Constitute yourself a committee of one to secure a new member. The American Public Health Association means much to its individual members but to the children of our country and the future health of our nation it means even more.

THE DEPRESSION AND HEALTH

IN our October issue we gave our readers the Presidential address delivered at our meeting in Washington. It was optimistic from practically every standpoint. Reports from 82 of our large cities as well as from the country in general showed a decline in both morbidity and mortality, which was practically continuous. Industrial life insurance companies also report low mortality rates among their policy holders. Even tuberculosis and pneumonia showed a marked decrease over the previous year. There was a marked absence of epidemic diseases. Since that time, influenza has become epidemic throughout a large part of the United States, but the type is mild, with a few complications and very little pneumonia, so that the influence on the death rate has not been marked.

All health workers have, however, been fearful of the consequences of malnutrition in children, and our President, in spite of his optimistic outlook, warned us that if present conditions should continue, there was a practical certainty that bad results would soon be in evidence, owing to lack of food of proper quality and quantity. With few exceptions, reports have continued to be good. Certainly all of us have been agreeably surprised by the good conditions which have persisted, but it is to be hoped that no one has lulled into a false sense of security. With something like 12 million people unemployed in our country, and 40 million or more feeling the pinch due to this, it is beyond belief that favorable conditions can continue, even if we are blessed with the good weather and mild winters which have characterized the past few years. Indeed, already there are some who state unequivocally that the effects of malnutrition are becoming evident. The recent hearings in Washington were heart-rending, particularly the statements made by responsible people in regard to the miners in the coal regions. In cities throughout the United States, the budgets for relief are falling far below the estimates and the needs. From the highest authorities, such as the Red Cross, we learn that in certain sections at least, relief is only 20 per cent of what it should be. In spite of the wheat and cotton distributed through the Red Cross,

many people are still in desperate want, and conditions are getting worse as supplies become exhausted.

The Health Organization of the League of Nations has made what is practically a world-wide study of the situation. The figures in question are necessarily old, but as we have already said, conditions are almost everywhere becoming worse rather than better. The estimate at the end of 1931 was that there were between 20 and 25 million unemployed in the world, and that between 50 and 60 million were directly or indirectly affected. The United States headed the list of unemployed, with Germany second.

This review accounts for the low death rate in children by the well known fact that in periods of economic depression, marriages and births fall, but recognizes that the decline was not sufficient to account for the lowered general mortality, or the lowered infant mortality. Even among growing children from 1 to 15, who are naturally affected by food restrictions, the death rate continued to fall.

One naturally turns to tuberculosis in a study of this sort, since it is well known that food restrictions lessen resistance and favor infection. During the World War we had a striking demonstration of this fact, since the increase in tuberculosis was greatest where food restrictions were most severe, yet here again, we get a favorable report. In certain towns the decrease reached record figures, and this is true for the United States in general. Certainly the unfavorable effects of our depression have not yet become marked, judging from available records, but these are not up to date, and later returns may alter the picture.

The physical effects are not the only damage caused by the depression. There is a profound psychological disturbance among the unemployed, and this seems to be particularly severe on adolescents. In this country we have an army of boys, estimated at 200,000 by no less authority than General Glassford, who are tramping the country. These boys have been crowded out owing to the fact that many homes are now housing 2 to 3 families. They are of the adventurous and spirited type, indeed the best of their class, and unless something can be done for their relief and organization, there is reason to fear permanent injury to their characters. In some countries, clubs for the young unemployed have been created. Practically all countries studied recognize the gravity of the situation, and are intent on devising ways and means for providing for these youths useful work, which will not only furnish food and good surroundings, but will relieve the mental stress which forms so grave a feature. In this country, the matter is being considered by our federal authorities as well as by the individual states, but no comprehensive solution has yet been found.

Everyone concerned has wondered why the depression has not brought physical and mental conditions worse than we find them. The answer is not entirely easy. Doubtless our health organizations, city, state, federal, and private, have sowed good seed in the past, and we are now reaping some of the rewards of their good work and organization. A succession of mild winters and the absence of severe epidemics have also helped, but when all is said and done—the answer is not to be found in any single feature yet mentioned.

LETTER FROM GREAT BRITAIN

VIEWS ON ECONOMY REPORTS

IN the family circle the member who preaches economy is usually the least popular. Nationally also the position would appear to be the same; judging at least from some of the opinions expressed with regard to the reports of the two chief bodies who undertook to inquire into the position here and show the way to savings.

The first body to take the matter up consisted of a number of members of Parliament and was more or less self-constituted. When its report appeared, pandemonium broke loose and bore away with it, into oblivion apparently, not only the report but the chairman also.

The second body, speaking generally, seems to have fared rather better. Largely this is because it was a special committee set up at the instance of the Chancellor of the Exchequer to investigate local expenditure, and its report was official and presented by command to Parliament. In spite of this, it has not been too well received by local authorities in general, or by organizations or associations connected with or concerned in local government. In especial, very strong objection has been raised to suggestions that appear to involve interference with public health activities, not only by health officers but by members of municipalities and social organizations.

The report itself, for the reason that in some respects it does not appear to be too well informed, offers opportunities for criticism, and these it may be taken have not been neglected. One of the strongest protests against it has come from the British Institute of Social Service, a voluntary body of importance and standing. The protest is in the form of a manifesto, the signatories including well known industrialists, educationalists, authors, publicists, and economists, among them Sir William Morris, of motor car fame, Sir Josiah Stamp, Sir Thomas Horder, the physician, recently created a peer by the King, Sir Oliver Lodge, Mr. John Buchan and Mr. H. G. Wells. The main appeal made is against any serious retrogression from the standards so laboriously erected by the local government system of the country.

Attention further is drawn specifically to the danger inherent in any attack upon the character of the local government service. In connection with this there is a fine tribute to those who work in an official capacity which it is hoped may be understood and appreciated by the public which "too little realizes the debt it owes to the great army of anonymous officials, so loyal, so devoted, so expert, so incorruptible, upon whose work the maintenance in being of the great society very largely depends."

DISAPPEARING SALARY CUTS

EVEN if there were indications of improvement this would be a difficult time of the year at which to recognize them. Nevertheless, in relation to the public health and local government service generally there have been certain happenings that may be regarded as suggesting that among members of local authorities in parts of the country the outlook appears brighter.

Included among these occurrences are the more or less complete cessation of talk about salary cuts, with hints as to the removal or modification of cuts already made. In some cases, indeed, cuts actually have been removed wholly or in part, and though the instances in

fact are few, very great value is attached to them because of the fact that they create a precedent and give others something upon which to base an appeal. That they will be so used increasingly as time goes on may be taken, and though nothing resembling a stampede is likely to occur, there will be a tendency on the part of a number of authorities to follow the example set by what may be regarded as more kindly and progressive councils.

The last time I made reference to the matter of salary cuts, I imagine I stated that largely it was a case of fifty-fifty, half the local authorities having imposed a cut graduated up to an average maximum of 10 per cent. Since then the figures have varied very little, the recent happenings referred to above giving rise to the hope that an end has been made of cutting and that the percentage of cut-free areas will steadily increase.

HOSPITAL ACCOMMODATION IN LONDON

FROM the medical point of view, one of the great changes made by the Local Government Act of 1929, which so very profoundly affected administration in this country, was in relation to hospital accommodation. Institutions which, up to the time the law altered, were part of the poor law provision, passed into the hands of the bodies responsible for local government generally, including public health. This change already even, it would seem, has led to improvements in this regard, and has been greatly to the advantage of the people. In London the effects of the alteration have been particularly marked, and though it has involved a vast amount of reorganization and labor, has caused comparatively little disturbance.

Reporting recently to the London County Council, Sir Frederick Menzies, the Medical Officer of Health, gave a very full and complete description of the processes involved in the change over and of the position so far as municipal hospitals are concerned.

The hospital branch of the hospitals and general medical services of the county council is divided into two main sections, one dealing with general and the other with special hospitals. The work of the first-named embraces the management of some 44 hospitals and institutions, containing round about 28,000 beds. The special hospitals division deals with the management of 31 hospitals, of which 17 are for infectious diseases. The beds number about 13,500. In addition to these institutions there are, of course, the voluntary hospitals—general and special—which do not concern the county council, but which greatly increase the number of beds available for the treatment of the sick of the metropolis.

Among the general hospitals there are such institutions as St. Bartholomew's, the Middlesex, Guy's, and so on, all of them very old, established, and historically interesting. Each of them is a medical school within the University of London, the staffs being concerned in teaching and preparing the students for qualifications granted by the University of London and other universities and recognized examining bodies.

So far as teaching is concerned, it is interesting to learn from Sir Frederick Menzies's report that provision is to be made for making use of the very valuable material in the hospitals for which the county council is responsible in a manner and to an extent never attempted while the institutions were in the charge of the poor law authorities. Included in the medical staffs of the hospitals are numbers of specialists of various kinds who give part-time service as consultants or otherwise. Recently these individuals have received notice of intention to determine their appointment, a move which is regarded as more or less of a formality though it may

indicate that reorganization is intended. That it may have some connection with the extension of the use of the institutions for purposes of instruction of medical students and the placing of members of the staffs of the teaching hospitals upon those of the municipal hospitals is just possible. Even if such a change were made it would make little difference in the quality of the work done in these institutions, which, as the report of Sir Frederick Menzies shows, has attained a very high level.

HONORARY FELLOWS OF THE ROYAL SANITARY INSTITUTE

THE Honorary Fellows of the Royal Sanitary Institute of Great Britain elected in December, 1932, I note, numbered two, both being citizens of the United States of America. That one should be Professor Mazÿck P. Ravenel is a matter that affords great gratification, not only to me personally but to members of the public health service in this country generally, partly on account of his contributions to *Public Health,* the official organ of our Society of Medical Officers of Health.

The Royal Sanitary Institute is a distinct body from the last-named Society, and in its composition resembles somewhat the American Public Health Association. In addition to including individuals officially engaged in the various branches of public health and preventive medical work as medical officers and engineers, etc., the Institute is prepared to admit as fellows, members, or associates, others who hold qualifications or are engaged in public or professional work of a recognized and appropriate type.

So far as medical officers of health are concerned, the Institute as a body is held in very high esteem, and in its fellowship are to be found the majority of the more active members in the field of public health.

The other occupant of the list of honorary fellows elected on this occasion is Dr. George A. Soper, of New York City, whose election has been a source of gratification to his engineering colleagues on this side.

London CHARLES PORTER, M.D.

New York City Bulletin

WE regret to note that with the issue of December 31, 1932, the *Weekly Bulletin* of the City of New York Department of Health ceased publication as such. In future, the Bulletin will be issued quarterly, but every effort will be made by the editor to keep up the continuity of the statistical data which have been presented in the past.

The *Weekly Bulletin* has existed in its present form since 1913, though, beginning in 1890, it was the outgrowth of a weekly summary of vital statistics published for the health officers and registrars of vital statistics. The discontinuance at this time is due to the rulings of the federal postal authorities. The expense has been a burden to the department which was felt to be unjust and unwise. If this law can be changed and second class mailing privileges granted, it is hoped that the *Bulletin* may resume publication weekly.

All who have received this *Bulletin* heretofore will miss it from their desks. It was always well edited, good reading, and full of useful information. We hope that it will soon be revived.

ASSOCIATION NEWS

RURAL HEALTH APPRAISALS

The Second Edition of the *Appraisal Form for Rural Health Work* published in January, 1932, is being unusually well accepted and is widely used. A number of state health departments are applying it to all their county health departments.

Those interested in the appraisal of rural health work will be gratified to know that Dr. E. L. Bishop's sub-Committee on Rural Health Work has taken cognizance of the fact that special health problems exist more frequently in rural than in urban areas, through the appointment of a special sub-committee to consider appraisals of activities designed to meet such special rural problems. This sub-committee, composed of Sophie C. Nelson, R.N. *Chairman*, Dr. Allen W. Freeman, and Dr. W. S. Leathers, is studying the problem and considering the possibility of preparing a supplement to the Rural Appraisal Form which would include definitions of the more important special problems (as a means of determining whether or not such items should be included in the appraisal of any given area) and the scoring of programs designed to meet such problems. It seems probable that malaria, hookworm, and trachoma will be the first three special problems to be considered.

NEW MEMBERS

The following list includes applicants who have been approved for membership in the A.P.H.A. by the Sub-Committee on Eligibility. These new members have requested affiliation with the sections indicated, and action by the Section Council will follow.

Health Officers Section

Paul H. Brown, M.D., 265 Main St., East Haven, Conn., Health Officer

Dr. Emily F. B. Chatfield, Voluntown, Conn., Health Officer

Edward J. Howland, M.D., 25 S. Main St., Colchester, Conn., Health Officer

William W. McFarland, M.D., 620 City-County Bldg., Pittsburgh, Pa., Director, Department of Public Health

Abbott B. Mitchell, M.D., Court House, Allegan, Mich., Director, County Health Unit

John H. Mountain, M.D., D.D.S., 172 Washington St., Middletown, Conn., Health Officer

H. R. H. Nicholas, 33 Ivy Lane, Englewood, N. J., Health Officer

Paul M. Spurney, M.D., City Hall, Shaker Heights, O., Health Commissioner

Dr. Cecil J. Vaughn, Lexington, Miss., County Health Officer

Vital Statistics Section

Harry W. Gehm, M.S., 531 Walnut St., Elizabeth, N. J., Statistician

Laboratory Section

George J. Hucker, Ph.D., New York State Agr. Exp. Station, Geneva, N. Y., Chief, Bacteriological Research

Israel Weinstein, M.D., Ph.D., Sc.D., 1165 Park Ave., New York, N. Y., Teacher of Bacteriology and Hygiene

Doris E. Wilson, B.S., 403 Second St., Jackson, Mich., City Bacteriologist

Public Health Engineering Section

Lyman B. Chamberlain, A.B., Barry County Health Dept., Hastings, Mich., Sanitary Officer

Bernhard P. Domogalla, Ph.D., 803 State St., Madison, Wis., City Biological Chemist

Bernard J. McMorrow, B.S., 113 Chandler St., Boston, Mass. (Assoc.)

John A. Scarlett, Allegan, Mich., Sanitary Inspector

Wilmer H. Schulze, Phar.D., 503 Rock Glen Rd., Baltimore, Md., Chief, Division of Chemical Technology, Department of Health

Food and Nutrition Section

Christine Hall, R.N., 69 Paradise Rd., Northampton, Mass., Supt., Smith College Infirmary

Gilbert H. Hood, Jr., 500 Rutherford Ave., Charlestown, Mass., Secretary, H. P. Hood & Sons, Dairy Experts

Child Hygiene Section

Dorothy L. Campbell, R.N., 112 Brighton St., Plainwell, Mich., Health Teacher

Gertrude B. Hansen, Box 133, Houghton, Mich., County Nurse, Children's Fund of Michigan

Leone V. Hartlein, R.N., Hastings, Mich., Health Teacher

Helen Linn, R.N., 428 S. Broadway, Hastings, Mich., Health Teacher

Margaret M. Nicholson, M.D., 1801 Eye St. N.W., Washington, D. C., Child Hygienist

Mildred L. Tuttle, R.N., 119 W. Green St., Hastings, Mich., Instructor, Health Education

Marion Wetzel, R.N., Kellogg Club House, Augusta, Mich., Health Teacher

Public Health Education Section

Maria W. Bates, B.S., 410 Stuart St., Boston, Mass., Student (Assoc.)

May E. Chinn, M.D., 44 Edgecombe Ave., New York, N. Y., Student (Assoc.)

Frank K. Fairchild, 86 Lefferts Pl., Brooklyn, N. Y. (Assoc.)

G. Hamilton Francis, M.D., 1024 E. Liberty St., Norfolk, Va., Promotion of Public Health, National Medical Association

Jethra Hancock, M.D., 532 W. Main St., Louisville, Ky., Director, Bur. of Venereal Disease, State Board of Health

Mrs. Joseph Sanders, 2612 Tilden St., Washington, D. C., Chairman, District of Columbia Health Congress of Parents and Teachers

Public Health Nursing Section

Jean MacD. Clark, R.N., 246 Monroe St., Allegan, Mich., County Nurse, Allegan County Health Unit

Sister M. Laurentine Harrington, R.N., St. Francis Hospital, Pittsburgh, Pa., Principal, School of Nursing

Ann Morton, R.N., Weyburn, Sask., Canada, School Nurse

Susan Smith Nobles, R.N., 422 W. Green St., Hastings, Mich., County Nurse

Lena M. Schermann, R.N., 636 Marshall St., Allegan, Mich., Allegan County Nurse

Rena D. Wing, R.N., Health Unit, Hastings, Mich., County Nurse

Industrial Hygiene Section

Lewis A. DeBlois, 15 West 11 St., New York, N. Y., Consulting Engineer on Occupational Disease Prevention

DR. BOLT RECEIVES OBERLAENDER AWARD

RICHARD A. BOLT, M.D., F.A.P.H.A.

Dr. Richard A. Bolt, M.D., F.A.P.H.A., Director of the Cleveland Child Hygiene Association and Editor of the Child Hygiene Notes Section in the *Journal*, has been granted the Oberlaender Trust Award "to carry on a detailed study of Maternal and Child Welfare Conditions in Germany and Austria."

"The Oberlaender Trust was founded under the auspices of the Carl Schurz Memorial Foundation, Inc., by Gustav Oberlaender, Reading, Pa., as an expression of his desire to be of greater service to the American people. The trust is for the specific purpose of furthering a better understanding of the German-speaking peoples by the American people and *vice versa*." Dr. Bolt will leave Cleveland early in April.

PUBLIC HEALTH ADMINISTRATION

India—In 1921 public health work in India was transferred with certain reservations from the Central Government of India to the governments of the various provinces. A ministry of health was not provided for in this change and no such central organization exists. The activities of the Central Government are maintained by the Department of Education, Health and Lands. In transferring these health activities to the provinces certain functions were reserved for the Central Government. These include international health affairs, epidemiology, census and statistics, emigration and immigration, pilgrim traffic, major port quarantine work, and medical research. In 1929 the birth rate in British India was 34.8 per 1,000; the death rate was 24.9, and the infant mortality rate was 178.4 per 1,000 births. The death rate of 25.9 may be compared with that of England and Wales of 13.4; for the United States, 11.9; for Austria, 9.6; and New Zealand, 8.8.

Kala-azar has been prevalent in the Eastern provinces of India. It was imported into Assam in 1882 and has slowly spread. At first the mortality rate was high, 90 per cent of the cases dying, but treatment with antimony has resulted in a 90 per cent recovery rate. Cholera in 1929 was the cause of 295,434 deaths in British India. The rôle of pilgrimages in the spread of this disease is well known and attempts at mass inoculation on a voluntary basis are being made in connection with these fairs.

There were 72,482 deaths from plague in British India in 1929, a mortality less than that for 1928 but more than in 1927. Reviewing the mortality for a number of years there is evidence that plague is progressively decreasing. One theory advanced is that there has been evolved a race of rats immune to plague. An inquiry is being made into the immunity of wild rats in different parts of India. Other causes ascribed to the gradual disappearance of plague are: (a) the exercise of a natural and common law which, as in other zymotic diseases, determine the rise and fall of epidemic conditions; (b) protection by inoculation, by sanitary measures such as deratization, rat proofing, etc.; (c) some influences acting in the flea factor.

There were 72,884 deaths from smallpox, the mortality among children under 10 years of age being 58 per cent of the total smallpox mortality. There were performed 9,579,806 primary vaccinations and 6,339,632 revaccinations. India still retains the unenviable reputation of being the greatest center of smallpox in the world.

This report from the hand of Major-General J. D. Graham, Public Health Commissioner for the Government of India, is replete with valuable tables, charts, and diagrams. There are nearly 500 pages of detailed information pertaining to the health of the Central Government and to the various provinces of India.—*Annual Report of the Public Health Commissioner with the Government of India for 1929.*

Attleboro, Mass.—In the 1931 health department report for this city of 21,982, attention is directed to popular health education.

A properly organized health department finds its duties more and more concerned with much needed education in public health. As the laws of health and hygiene are better understood, the control of disease becomes a simpler and more effective procedure. When

health education is extended to arouse an increasing interest in health, a public demand will be created for better health standards.

The program included the publication and distribution of literature and reports, as well as newspaper publicity through articles and paid advertisements. A thorough house-to-house canvass of the whole city was conducted as a part of the diphtheria prevention program. Incidentally, there were 8 cases of diphtheria, with no deaths, only 1 death from this disease having occurred in 4 years. Several extra nurses were employed to give first hand information and advice by direct talks with parents in their homes. The health camp furnished daily instruction to 40 boys, who not only learn but live health habits during the camp season. The teaching of these boys was continued through the winter in special weekly class meetings at the Y.M.C.A.

Montreal, Quebec — Scholarships were granted by the city administrators in 1931 to two physicians of the Department of Health in order that they might complete their studies in public health at Johns Hopkins. Appointment was made by the city executive committee on the recommendation of the Department of Health Director. In the terms of the grant of $1,200 to each physician, the appointed physicians are to remain in the city's employment for a period of 5 years, and their leave of absence was granted with salary for the duration of the course. "Such special training of members of the staff will contribute greatly in maintaining the Department of Health of the city on a high standard."

During the convention of the American Public Health Association, held in Montreal in 1931, the foundation of a Public Health Institute in the Province of Quebec was suggested. The proposed plan, with a draft of organization, is published in the annual report of the department of health in order to explain and stimulate interest in this program for the education and training of public health officers.

In 1931, a campaign of propaganda was inaugurated in an effort to teach mothers the value of breast feeding. Lectures to physicians and nurses of the child hygiene division of the department, and an illustrated poster "mother feed your baby yourself" with a distribution of 25,000 copies, were among the features. Both the poster and publications were distributed through the medium of baby clinics. Immunization against diphtheria was continued, 10,056 children having received three preventive treatments.

Bernalillo County, N. M.—While no cases of typhoid were traced to infected water, milk, or other food, a large number were secondary, developing in homes where inadequate attention was paid to personal hygiene and disinfection of body discharges, according to the 1931 County Health Department report. Multiple cases included in one instance 7 different members of the family who contracted the disease from the original patient.

Tuberculosis cases and deaths decreased considerably in 1930 and 1931, "perhaps due to the fact that economic conditions militated against the individual with tuberculosis migrating to the Southwest in search of climatic advantages."

The budget of $15,852 gives a per capita expenditure of $.326 for the year by the County Health Department. There were 107 lectures given with an attendance of 8,417; 1,614 bulletins and 645 circular letters were distributed; 345 newspaper articles on health were printed; and 5 health exhibits were prepared. One of the commendable features of this report is a 2-page statistical summary of 22 major activities, which effectively picture the scope

of services and will be useful for comparative purposes another year as well as for comparison with the work of other departments.

Brantford, Ontario—The annual report of the health officer for 1932 records the use of toxoid for 10 years during which time 10,892 children have been treated. The last case of diphtheria was reported in 1930. An average tuberculosis mortality rate of 22.9 for 3 years is noteworthy. This is less than one-third of the Dominion rate and less than one-half of the rate for the Province. In stressing the importance of health education in fighting tuberculosis, the Deputy Minister of Health is quoted as saying, "Health education is one thing which is extremely important in promoting and stimulating public interest in wiping out tuberculosis." He urged volunteer health organizations to "Spread the gospel of health, draw public attention to articles written on this subject, bring the matter to the people who are governing us, and work on them until they do something about it."

United States Public Health Service—The Surgeon General's report for the fiscal year 1932 notes that "The increasing use of international aerial transportation makes it of special importance that current information relating to the prevalence of disease in foreign countries be available." Cholera was not reported outside of Asia and the adjacent islands. In the Philippine Islands there were 936 cases reported as compared with 4,600 in the previous year. All of the grand subdivisions of the world except Australia reported plague in 1931. In North America no case of human plague was reported. Yellow fever exists in endemic form in extensive regions in Africa and South America. International health agencies recorded 160,000 cases of smallpox, with 33,000 deaths, as compared with 315,000 cases and 65,000 deaths, the previous year.

The general health of the people of the United States as reflected by mortality rates was maintained at a high level during the past 2½ years.

. . . It is quite probable that the present remarkably good health conditions are, to some extent, the direct result of efforts on the part of health agencies, which have, no doubt, retarded the evil effects of unemployment and economic hardships upon health. The fortunate absence of any serious widespread epidemics has also been a factor.

Regular coöperative rural sanitation studies and demonstrations were conducted in 144 projects in 28 states. The annual survey by the Service showed that on January 1, 1932, there were 616 counties in the United States operating permanent local health service under the direction of a full-time medical health officer, an increase of 59 over the number recorded the previous year.

This comprehensive report deals with the measures carried out for the prevention of the introduction of diseases from abroad, the medical examination of aliens, the prevention of the spread of diseases in interstate commerce, and important investigations of public health problems, including cancer, heart disease, leprosy, mosquito control, pellagra, and many other conditions.

Providence, R. I.—In the 1931 annual report of the Providence Superintendent of Health, attention is properly directed to the 48 years of continuous service, as superintendent, of Dr. Charles V. Chapin, Dean of health officers, who recently retired from this office.

. . . Dr. Chapin is not only a student but also a clear practical thinker, which qualities brought him widespread distinction. Under his leadership, the health department of this city was not merely efficient but a step or two ahead of other cities. The work of the de-

partment has been centered on the things which are most necessary and worth while.

During 1931, there were 1,137 prenatal letters distributed. Six nurses supervise the children delivered by midwives until they are 5 years old, making 14 calls on each well baby before it is 1 year of age, monthly calls during the second year, and 4 calls a year thereafter. One nurse supervises the infants and young children in licensed boarding homes, and the infants of such unmarried mothers as are not under the nursing supervision of private agencies. One nurse from the department makes 1 visit upon each infant delivered by a physician, provided the mother is not on the maternity service of the district nursing association or a ward patient at the Lying-In hospital. Coöperating with the State Children's Bureau, this nurse also visits periodically the licensed maternity homes and some of the day nurseries in Providence. The infant mortality rate was 57.5 for the year.

The school dentist examined the pupils of the second and third grades of 20 parochial and special schools. Of the 2,003 pupils, 1,559 had carious teeth or some other dental defect. Children found in need of treatment by school dentists, physicians, or nurses were referred to their family dentists, but if parents were unable to pay a private dentist, the children were referred to one of 3 hospital or special clinics, or if below the fourth grade, to one of nine public school dental clinics for treatment. The Exchange Club continued to provide dental treatment at home to persons ranging in age from 3 to 21 years who were so physically or mentally handicapped that they could not attend a dental clinic.

Public Health Organization in Indiana—The first regular meeting of the Indiana State Board of Health was held January 18, 1882. The total appropriation for the first biennial period was $5,000 per annum. This year the Indiana State Board of Health is celebrating its 50th birthday.

Few health organizations can boast of only 5 administrators over a period of 50 years—an average of 10 years per administrator. This speaks highly for the efficiency of the Indiana organization and its removal from political intrigue. As a matter of fact the State Board of Health has had practically only 3 administrations as the first 2 health officers served but a few months each. Dr. Metcalf served as Secretary from 1884 to 1896. Dr. Hurty, that great pioneer of health promotion, a former President of the American Public Health Association (1912), served from 1896 to 1922, and his successor, Dr. King, is still in command.

At first the State Board of Health devoted its energy to the establishment of local boards of health in counties, cities, and towns throughout the state. A state quarantine law was enacted in 1903 and the laboratory established in 1905. A model housing law was passed in 1912. The present State Health Department is organized with the following divisions: Executive, Vital Statistics, Chemistry (including milk and food), Communicable Disease (including venereal disease), Infant and Maternal Hygiene, Public Health Nursing, Housing and Industrial Hygiene, and Laboratory of Bacteriology. In 1931 the annual appropriation was $275,000. There are 108 employees, all of whom are full-time except the medical directors in charge of 14 venereal disease clinics.

The first white settlement in Indiana was that of Vincennes and it was here that pioneer efforts were made to improve the health of its citizens. The first health ordinance in Indiana was passed in Vincennes in 1819 prohibiting the creation of nuisances which were

against the public comfort and welfare. It dealt largely with garbage and other offensive matter. The town constable was empowered to remove or cause to be removed all nuisances from the street and penalties could be invoked. This town was visited by an epidemic of yellow fever in 1820. In 1832 Asiatic cholera raised havoc in many communities and other health boards were appointed, especially that at Madison.

It is stated that the first native of what is now Indiana to be vaccinated against smallpox was Little Turtle, a famous Miami Indian Chief. The story goes that he was vaccinated at the time of a visit to Washington where he went to confer with the great White Father.

The first health board in Indianapolis was established in 1850. A public water supply system was constructed in Madison as early as 1816. This bulletin is filled with valuable historical facts concerning the early development of public health administration in Indiana. —*Month. Bull.*, Indiana State Board of Health, Nov., 1932.

U. S. Children's Bureau—During the fiscal year ended June 30, 1932, short, intensive courses in obstetrics (on request of state departments of health and county medical societies) for doctors in active practice, carried on for 2 years through the coöperation of the medical school of Emory University in Atlanta, Ga., were extended to rural communities in Kentucky and Mississippi. Courses are scheduled for New Hampshire.

A special investigation was carried out in New Haven of the value of salmon oil in the treatment of infantile rickets.

If the quantity of salmon oil potentially available in the salmon canning industry were to be put on the market as a properly standardized food and supplied at low cost through the usual channels for distribution of food, one of the great nutritional needs of children would be more easily and more adequately met.

Ten years ago, it is stated, approximately 121,000 children were receiving aid in the 40 states that then had mothers' aid laws. In 1931 reports from 44 states and the District of Columbia show that approximately 250,000 children were receiving this form of assistance in their own homes. The total amount reported as paid to mothers' aid families during 1931 was approximately $35,000,000. In 82 per cent of these families, the father was dead; in 5 per cent he had deserted the mother; in 2 per cent the parents were divorced; in 3 per cent the father was in prison; in 4 per cent he was physically disabled, and in 3 per cent mentally disabled.

For the last 4 years the recreation specialist of the bureau has given most of her time to furthering programs in rural districts. This work has been done in coöperation with the extension division of federal and state departments of agriculture, and has reached many groups of older boys and girls and women, and a number of mixed groups of men and women. Last year there was an increase in the numbers of adult groups seeking advice and assistance in planning for leisure-time activities and social life for their communities.

The Children's Bureau, among other activities, has been engaged actively during the last 2 years in the development of the current reporting of local social statistics and centralized tabulation and analysis. Such a plan is necessary to provide for information as to significant national and local trends in social and health services in child welfare and related fields.

LABORATORY

TITRATION OF THE NEUTRALIZING POTENCY OF ANTI-MENINGOCOCCUS SERUM BY THE PHENOMENON OF LOCAL SKIN REACTIVITY*

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A SERIES of tests was undertaken to investigate the possibility of using the measurement of the neutralizing potency by the phenomenon of local skin reactivity [1] as a control upon the method for standardization of anti-meningococcus serum by the agglutination test.

Preliminary tests were carried out by the method of Shwartzman [2] without "auxiliary antibody." The results confirmed the observation of Shwartzman [3] that differences were obtained in the degree of neutralization of filtrates of different strains of meningococci even from the same group.

The sera tested by this method did not appear to be high in neutralizing potency when a serum titrated against a group-III toxic filtrate sent us by Dr. Shwartzman was used for comparison. Clinical reports on lots of serum from two horses from which some of the sera tested were obtained indicated that they were therapeutically effective. Of 30 reports returned on the use of serum from one horse, 25 were of recoveries; of 14 on the use of serum from the other horse, all were of recoveries.

In an attempt to obtain serum of high neutralizing titer, immunization of horses with toxic filtrate together with live culture was undertaken. At the same time because of the expense involved and in an attempt to control some of the variables in the Shwartzman test, another method of titration was used. Neutralization of various dilutions of a broth-filtrate toxin by the serum to be tested in a series of intradermal injections on the depilated backs of large rabbits was compared with neutralization of the same dilutions of toxin by normal horse serum and by other sera on the same animal. The intravenous injection given 18 hours later was 0.2 per cent agar.[4]

With this technic, differences in neutralization, such as are observed in the simple intracutaneous tests with streptococcus toxin and serum, were also revealed with the meningococcus toxin and serum; and the necessity for reliable standards of comparison before the test will be of value as a method of standardization was clearly indicated. For the present, however, it is of value in permitting direct comparison of the test serum with other sera on the same animal.

When tested by this technic, the method of immunization with live culture intravenously, together with toxic filtrate subcutaneously, apparently produced serum of higher neutralizing titer in one horse than was usually obtained with the routine method of injection with live culture intravenously only. The serum of another animal under immunization by the latter

* Read before the Laboratory Section of the American Public Health Association at the Sixty-first Annual Meeting in Washington, D. C., October 24, 1932.

method, however, was just as high in neutralizing potency.

Clinical reports on the therapeutic value of sera from these horses are not as yet available.

CONCLUSIONS

Titration of the neutralizing potency of antimeningococcus serum by the phenomenon of local skin reactivity is possible within certain limits.

The significance of the test as an indication of therapeutic value has not yet been established but the simpler technic, although not sufficiently developed to be used as a method of standardization, provides a means for comparison and evaluation and supplies information not obtained with the agglutination test.

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SOME VARIANTS OF *BACILLUS MEGATHERIUM**

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THE variation of *Bacillus megatherium* has been studied in meat infusion broth at pH 6, 7, and 7.8, with and without the addition of lithium chloride. A large number of variants were obtained under different conditions. Some of the most interesting variants came from the alkaline broth. One of these was a pigment forming strain growing in deep yellow colonies. Another was a very heavily capsulated strain in colonies which flow if the Petri dish is tipped at an angle. A third variety gave a thin, translucent colony containing, even before it was 24 hours old, over 30 per cent of shadow cells. A fourth strain, with a similar translucent colony when young, showed an excessive formation of buds at the tip of the cells, where as many as four spherical buds in a chain, reminding one of mold conidia, were observed. Formation of buds along the side of the cell was less frequent. Sometimes a bud at the tip of a cell would be elliptical with the long axis perpendicular to the long axis of the cell. Such buds were isolated in micro-droplets and found to grow into rods which multiplied. Many of the spherical buds and the elliptical ones were very actively motile and showed flagella similar to those of the cell from which they originated. This strain was non-capsulated and no spores were seen in hundreds of cultures in micro-droplets, where normal strains sporulated very profusely. Aside from budding, this strain formed, even in young colonies, an unusual number of peculiar cell forms similar to what has been described in the literature as arthrospores, microcysts, etc. Many of these peculiar forms were actively motile.

Other interesting variants have been isolated, but have not yet been studied in detail.

All of these variants can be kept

* Read before the Laboratory Section of the American Public Health Association at the Sixty-first Annual Meeting in Washington, D. C., October 27, 1932.

stable by frequent plating, and all of them tend to change in old colonies and old liquid cultures.

The colonies of *Bacillus megatherium* show regular cyclic changes, common to the parent culture and to all of the variants. These cyclic changes consist in the formation of concentric translucent and opaque zones. Depending on the variant, the center of the colony may be opaque or translucent. The translucent rings contain mainly shadow cells, some spores, and other forms. The opaque rings are made up of cells of normal appearance and cytology.

In about 3 days or more secondary growth can be seen in the form of opaque pimples over the area of the whole colony and sometimes as outer rings or extensions of various shapes of the margin of the colony. The secondary colonies follow similar transformations to those of the parent colony and may give rise to tertiary colonies. When secondary colonies are cultured, they usually reproduce the parent strain. However, the yellow strain forms white secondary colonies with a yellowish tinge giving rise on further cultivation to colonies of the same color and to the yellow colonies of the parent strain. Sometimes the secondary growth is too dense and continuous, and pimple-like colonies appear after a long incubation. This probably represents a tertiary growth.

When the colony becomes very old, the primary growth almost entirely disappears, and the faint area of the colony shows most evidently the small, pimple-like secondaries.

An attempt was made to study the sequence of variants from a given initial type. In some cases a sequence has been demonstrated, while in other cases no regularity has yet been discovered.

A daily transfer of the culture in dissociation experiments has been found to result in the selection of certain types which grow best under the given conditions. Aging of cultures which for a long time gave only the same types when frequently transferred, resulted in the appearance of a variety of other forms.

VITAL STATISTICS

Vital Statistics for Rhode Island—1932—Preliminary figures on file in the Public Health Commission of Rhode Island, show a birth rate for the state in 1932, of 15.7 per 1,000 population, a marriage rate of 5.7 per 1,000, and a death rate of 11.6.

The filing of late returns for births and marriages will change the birth and marriage rates slightly, but not sufficiently to be of significance. The few deaths that occurred in 1932 too late for filing before the new year will make little if any change in the death rate.

The birth and marriage rates are the lowest recorded in Rhode Island since 1855. In spite of a steady increase in population amounting to over 55 per cent since 1902, the actual numbers of births (11,061), and marriages (4,048) are the lowest in the past 30 years. While the depression has undoubtedly played a part in the declining marriage rate, which is reflected in the birth rate, the depression has only accelerated a downward trend in marriages and births which has been evident during the past 10 years.

The death rate for 1932, of 11.6 is the second lowest death rate recorded for Rhode Island since 1855. Only for the year 1931, when the death rate was 11.4, was the record better. The increase of two-tenths of a point in the

rate for 1932 over 1931 is due to a slight increase in deaths during November and December as compared with the corresponding months of 1931. During the first 10 months of 1932 the death rate was the same as for the corresponding period of 1931.—Births, Deaths and Marriages Recorded in Rhode Island During 1932. Released January 5, 1933.

Birth Rates and Fecundity in Italy—The annual number of births of living children in Italy increased in the 19th century until it reached 1,152,906 in 1887. Thereafter it declined gradually until it was 1,042,090 in 1903. There was a gradual decline to 1,040,000 in 1928, the lowest it has been in normal (non-war) years since 1887. But the decline in other European countries is even greater. The deaths in Italy reached a maximum of 869,992 in 1880, decreasing to 635,788 in 1912, rising to 1,240,425 in 1918, but decreasing to 611,362 in 1927. In 1887 the excess of births over deaths was 323,914, and in 1928 it was about 426,000. In Poland this excess was 427,366, in Germany 404,699, in Spain 216,167, in Great Britain 200,405, in France 65,042 in 1927. In 1927 Italian fecundity was 30 per cent inferior to the level of 1866–1875.

The fecundity of legitimate births was 26 per cent lower and that of illegitimate births was 50 per cent lower in the same period of comparison. Illegitimacy has diminished in Italy until it comprises less than 5 per cent of the births. This decline may be due to greater precautionary measures rather than to increased sexual morality. Italy has a legitimate fecundity rate of 214 per 1,000 marriages in the fertility period as compared with the French rate of 139, the English of 133, and the German of 128. In 1926, the Italian birth rate was 27.2, the death rate 16.9, leaving an excess of birth over death rate of 10.3. The birth rate in various Italian provinces varies between the low British and the high Japanese rate. The death rate varies between the low British and the high Russian. The gain in births over deaths varies between the low French and the high Polish and Japanese rates.—L. L. Bernard—Mortara, Giorgio. Natalitá e urbanesimo in Italia. I. *Nuova Antologia*. 64, 1374:485–496 (June 16), 1929. *Social Sci. Abstr.* 4:2080–2081 (Dec.), 1932.

Mortality in the Industrial Population, 1932—In no previous year has the health record of the industrial populations of the United States and Canada equalled that of 1932. This is clearly indicated by the mortality experienced by the many millions of industrial policy holders of the Metropolitan Life Insurance Company. Their death rate for the year was at the unprecedented figure of 8.34 per 1,000 living, at ages 1 and over—lower by a narrow margin than the previous minimum of 8.37, registered in 1930.

New minima were recorded for 9 important causes of death, namely, typhoid fever, measles, whooping cough, diphtheria, pneumonia, tuberculosis, diarrheal diseases, conditions incidental to pregnancy and childbirth and accidents. Furthermore, among the various types of accidental death, new minima were recorded for accidental burns, machinery accidents, and drownings.

Based on what has happened among these insured wage-earners and their dependents, it is safe to say that the death rate of the general population, in 1932, was also at a new low point. The mortality rate of this large group of insured persons has always proved to be an accurate index of health conditions in the general population—both in the United States and Canada—the mortality statistics for which do not

become available until approximately 1 year after it is possible to publish the figures for the insured group.

The 1911 death rate among Metropolitan industrial policy holders, at ages 1 and over, was 12.5 per 1,000. Had this death rate of 21 years ago prevailed again in 1932, nearly 70,000 more of this insured group would have died than the 139,491 who actually did die during the year. In 1931 alone this net saving amounted to 32,000 lives of policy holders and the accumulated saving since 1911 is over 464,000 lives.

The expectation of life, at birth, among Metropolitan industrial policy holders for the year 1931 was 57.90 years. This may be compared with an expectation of 46.63 years in 1911–1912, a gain of 11.27 years during the two decades. This corresponds to a gain of 24.2 per cent in the average life span of the industrial policy holders. In the general population, in approximately the same period, the gain was only 6.66 years. Thus the improvement among the insured wage earners and their dependents has been almost twice that for the population at large.

It is a matter of great interest that the expectation of life of the industrial population is now within 2 years of that of the general population. Twenty years ago, there was a difference of 6½ years in favor of the general public. In other words, working men and their families have shown a marked improvement in their vitality. This is due, for the most part, to considerable decreases in the mortality at all of the younger ages of life, because the preventable diseases have been brought, to a marked degree, under control. Few realize the enormous social and economic benefits which these gains have brought about.

The outstanding public health fact of the year was the reduction of the tuberculosis death rate from 76.2 in 1931 to 69.8 in 1932, a new low point. The drop in a single year was 8.6 per cent, the greatest year-to-year decrease in a decade. The improvement among insured negroes was even greater than for the whites. The tuberculosis death rate has now reached 70 per 100,000. The decline in the mortality from tuberculosis in a single year effected a saving of 1,100 lives in 1932 alone.

The death rate for the 4 principal communicable diseases of childhood has dropped exactly 50 per cent in 4 years, and almost 70 per cent in 10. The death rate for each of these diseases, except scarlet fever, is the lowest ever recorded; and that for scarlet fever is one of the lowest. Even diphtheria, to which the chief interest attaches, has become a minor cause of death. It promises soon to be so entirely out of the picture that no place need be assigned to it in the statistical tables.

The mortality rate for pneumonia dropped in 1932 to a new minimum of 56.8 per 100,000, a decline of 8.5 per cent from the previous low point recorded in 1931. Both white and colored policy holders shared in the improvement.

Despite the country-wide outbreak of influenza in December, the year closed with a mortality rate for influenza of only 17.6 per 100,000, which is well below the average for the last 10 years.

Deaths from conditions arising out of pregnancy and childbirth have shown a practically continuous decline among insured women over a period of 12 years. The puerperal death rate of 1932 (10.6 per 100,000) is about half that recorded for the first few years of the decade beginning with 1920. Nevertheless, crude death rates are misleading as a gauge of developments in the mortality connected with childbirth. The drop is due, in part, to the declining birth rate, whereby women have been exposed less frequently to the hazards of childbirth. The ratio of puerperal deaths per 1,000 live births is a much better measure of what has happened.

But, unfortunately, it is not possible to give this more accurate measure for maternal mortality in this industrial insurance experience. In the general population, where birth data are available, the puerperal death rate per 1,000 live births has shown but little variation from year to year, and is far higher than it need be. It is double the figure which prevails in Denmark and 50 per cent above that in England and Wales. It has been estimated that nearly two-thirds of the deaths which occur could be prevented if expectant mothers received the type of care made available by certain agencies which have concentrated on the care of pregnant women.

Since 1929 there has been a distinct and continuous decline in the alcoholism death rate. In that year it was 3.5 per 100,000; in 1932 it was only 2.4, the lowest figure recorded among Metropolitan industrial policy holders for 10 years. On the other hand, the rate for cirrhosis of the liver, which is often of alcoholic origin, has shown a slowly rising tendency in recent years.

The 1932 mortality record was distinctly unfavorable for 3 diseases, which recorded new maximum death rates. These are cancer, diabetes, and diseases of the heart. A definite upward trend has been manifest for each over a long series of years.

The most disquieting development of 1932 was another sizeable increase in the mortality from cancer. This amounts to 7.8 per cent in a single year, and to 15.8 per cent in 2 years. There has been, for several decades, all over the world, a slow but persistent rise in the cancer death rate; but it is difficult to assign a reason for the sharp acceleration of the last 2 years among insured wage earners. With the exception of diabetes, no increase of equal magnitude has been in evidence for any disease. Whether the population at large has experienced a similar rise cannot be determined at this time. Such fragmentary data as are available indicate that it has not, although the increase in 2 years appears to have been greater than the average during the last decade. Among the insured, there has been a shift in the relative age distribution whereby a somewhat larger proportion than formerly is now in the higher age ranges where most of the deaths from cancer occur. This alone would bring about an increase in the crude death rate, not only for cancer but for the several "degenerative" diseases. If, however, this had been the sole cause for the rise in the cancer mortality rate, we would have experienced corresponding increases in the rates for cerebral hemorrhage, chronic nephritis, and heart diseases. Such increases have not been observed. The rises in 1932 for cerebral hemorrhage and chronic nephritis were negligible, and that for heart disease amounted to less than 5 per cent in that year, and to only 7 per cent in 2 years. The unprecedented increase in cancer deaths, among the American wage earning population, has attracted attention all over the world. One commentator suggests that it may be related to an increasing hesitancy to call for medical and surgical aid when the patient and his family are without means to pay for it.

Had the much lower cancer death rate of 21 years ago prevailed in 1932, 4,026 fewer Metropolitan industrial policy holders would have died of this disease than the 15,394 who actually died during that year. Had even the rate of 1931 prevailed, 1,117 fewer lives would have been lost.

The previous high point for diabetes was 21.4 per 100,000, in 1931; and the rise, in 1932, was to 23.3, or 8.9 per cent. The increase in only 2 years has amounted to practically 25 per cent. The death rate for this disease has now risen continuously for 8 years.

There are, nevertheless, certain encouraging aspects in the problem of

diabetes. Despite the rapidly rising death rate, diabetics are living longer today than ever before. The average duration of their lives from the onset of the disease, to death, has increased materially since the discovery of insulin. Recent investigation has shown that the death rate has declined among persons under 45; but among older people, particularly among women, the rate has increased. It is in these older age ranges that the incidence of the disease is highest; and here the rise in the death rate has more than counterbalanced the drop in the younger age groups.

The mortality from heart disease, the leading cause of death since 1922, continued to mount, in 1932, with the rate reaching the new high point of 157.4 per 100,000. This is a rise of 4.9 per cent from the previous maximum recorded in 1931 and of 11 per cent, as compared with the figure for 1911. Since 1919, there has been a decided upward trend in the cardiac disease death rate, although the increase has been by no means continuous.

The one bright spot with respect to the heart disease mortality record is that the rate is declining at the younger ages. This means that such items as school medical inspections, industrial hygiene, and other preventive efforts against heart disease are bearing fruit; for, while heart conditions usually cause death late in life, they often begin in childhood or adolescence. As cases of diphtheria, the other infectious diseases of childhood, tonsillitis, dental diseases, and other focal infections become fewer, cardiac impairments at the younger ages may be expected to decrease in number.

The death rate for all kinds of accidents combined was lower in 1932 than ever before. This reflects, primarily, the drop during that year in industrial activity, in transportation, and more particularly in automotive traffic, both pleasure and commercial. The decrease in automobile fatalities, as compared with 1931, amounted to 14 per cent.

Three types of accidents recorded lower death rates in 1932 than ever before, namely, accidental burns, machinery accidents, and railroad accidents.

The rise in the suicide death rate in 1932 was less than 6 per cent, a smaller year-to-year increase than has been observed in a number of previous years. The facts concerning suicide show clearly that the rise in the death rate, since 1929, is not entirely chargeable to the unfavorable economic conditions which have prevailed during the last 3 years. There has been a continuation of an upward trend that has been in evidence since 1925—over a period which includes some of the most prosperous years in the history of the country. Furthermore, the suicide situation has improved materially in two decades. For the last year, 10.8 Metropolitan industrial policy holders in every 100,000 took their own lives, whereas in 1911 suicides accounted for 13.3 deaths per 100,000.—*Stat. Bull.* Met. Life Ins. Co. 14:1–8 (Jan.), 1933.

PUBLIC HEALTH ENGINEERING

SHELLFISH TREATMENT PLANT AT NEWBURYPORT, MASS.

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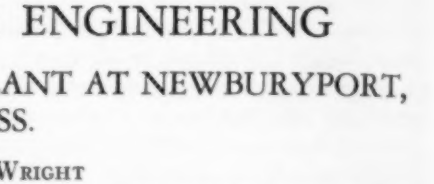
FOLLOWING an extensive examination in 1925 of the Massachusetts tidal waters and the shellfish therein, the State Department of Public Health closed to shellfishing many thousands of acres of shellfish producing areas. This action caused considerable distress in many localities where shellfishing was an important industry, especially in the city of Newburyport where some 3,000 acres of flats were declared to be contaminated.

The department has since carried on extensive studies and experiments under the direction of H. W. Clark, Chief Chemist, and Edward Wright, Sanitary Engineer, Massachusetts Department of Public Health, with a view of finding some practical method for the purification of shellfish. It was found that transplanting into clean waters was impracticable when applied to soft shell clams. Therefore, experiments were begun with the use of chlorine. An experimental plant was subsequently established in Newburyport and operated successfully for several months, under varying temperatures.

The present municipally owned plant at Newburyport was built by the city in 1930. It is located at the northern extremity of Plum Island at the entrance to Newburyport Harbor and it is a single story wooden building consisting of a tank room, laboratory, receiving room, and a shipping platform.

The tank room is 50′ by 30′ in plan and contains 8 concrete tanks. The cast-iron sea water intake pipe is about 120′ long and 4″ in diameter. Water is pumped on the incoming tide only by means of a centrifugal pump having a rated capacity of 350 gal. per min. and driven by a 10 H. P. motor. There are also 2 air blowers, each having a capacity of 54.5 cu. ft. per min. and driven by a 5 H. P. motor. Each tank is 16′ long, 5′ wide and 5′ deep, and capable of holding about 35 bbl. of clams. The tanks are provided with 4″ inlet pipes and 6″ outlets and two 1″ galvanized iron perforated air pipes near the bottom of the tank.



Newburyport Shellfish Treatment Plant—Laboratory and Shipping Platform (Note boxes used at the plant)

Upon arrival at the plant the clams are "culled" over to remove all dead or damaged shellfish and then they are placed in boxes of wood and wire construction holding about ½ bushel each. Before being placed in a tank the raw clams are washed in sterilized sea water and the same process is repeated at the end of the treatment. As sea water is

pumped into the tank a sufficient quantity of sodium hypochlorite solution is added to sterilize the water. During the treatment period smaller quantities of chlorine are added at 2-hour intervals until the residual free chlorine is brought up to about 0.3 or 0.4 p.p.m. It has been found that chlorine if present in excess of 0.5 p.p.m. would interfere with the natural functioning of the clams upon which the purification process depends. To replenish the oxygen consumed by the clams, air is blown intermittently in the tank, which also helps to obtain a more uniform diffusion of chlorine.

Samples of raw and treated clams of each lot are tested daily in the laboratory of the plant. All shellfish are treated for at least 24 hours, and, in case the raw scores are found to be 140 or more, longer treatment periods are required.

All shellfish are dug and transported to the treatment plant under the supervision of deputy wardens appointed by the State Supervisor of Marine Fisheries, and daily receipts, as well as weekly reports, containing information regarding quantities of shellfish dug, areas dug from, etc., are mailed to the Supervisor of Marine Fisheries and duplicates to the Department of Public Health. Daily reports of the bacteriological and chemical laboratory at the plant are mailed to this department, giving the results of bacterial tests of the raw and treated product. The operation of shellfish treatment plants is controlled by the State Department of Public Health under authority of Chapter 235 of the Acts of 1930, which provides that all such plants shall be approved in writing by the Commissioner of Public Health as to the location, construction, and operation thereof, and as to the person in immediate charge thereof.

The law also provides that the commissioner may revoke the approval of the plant at any time, and it authorizes the department to promulgate rules and regulations. Such rules and regulations have been drawn up, and the operation of the plant is checked up regularly to see that it is operated in conformance with the said rules and regulations. Samples of raw and treated shellfish are collected frequently and tested at the state laboratory.

Newburyport Shellfish Treatment Plant—Tank containing clams in process of purification

The operation of the shellfish treatment in plants in Newburyport and elsewhere has proved beyond doubt the practicability of purifying shellfish by means of chlorine. As a result, large clam growing areas have been reclaimed and work has been provided for hundreds of men.

A copy of the rules and regulations under which this and other similar plants are operated follows. Shellfish treatment plants have been established subsequently at Plymouth and Scituate but the Newburyport plant is the only one now in operation. These plants appear to be a financial success when the clam business is good.

The writer has charge of shellfish in-

vestigations, and supervision of treatment plants. He is assisted in this work by A. C. Bolde who collaborated in preparing this article.

RULES AND REGULATIONS RELATIVE TO THE OPERATION OF PLANTS FOR THE TREATMENT OF SHELLFISH PROMULGATED UNDER THE PROVISIONS OF ACTS OF 1928, CHAPTER 323, ACTS OF 1929, CHAPTER 372 AND ACTS OF 1930, CHAPTER 235

Adopted by Massachusetts Department of Public Health on March 8, 1932

1. All shellfish treatment plants shall be kept under adequate supervision by a qualified chemist or bacteriologist at all times, and no shellfish shall be taken therefrom until passed by the person in charge after treatment as provided in the following rules and regulations:

2. The person in immediate charge of a shellfish chlorinating plant shall send a detailed description in writing to the Department of Public Health of all areas from which it is proposed to take shellfish for treatment purposes at least 1 week before shellfish are to be taken therefrom. Upon taking shellfish from a contaminated area under a written permit from the Supervisor of Marine Fisheries the person holding the said permit shall forthwith deliver the shellfish so taken to the person in charge of the treatment plant or his assistant and receive a receipt therefor either as to the quantity or weight, and as to the date and hour of delivery. Duplicate receipts shall be forwarded weekly to the Department of Public Health.

3. Storage compartments shall be provided for untreated shellfish, and all such shellfish shall be kept wholly separate from treated shellfish. The said compartments shall be under the supervision of the person in charge of the plant. A separate entrance shall be provided for the untreated shellfish. All shellfish shall be handled and stored under such conditions as will keep them alive.

4. All shellfish shall before treatment be thoroughly washed or hosed either with sterile sea water or water from some other source approved by the department, until all foreign matter is removed. All shellfish shall again after treatment be thoroughly washed or hosed with water taken from a source approved by the Department. In washing or dousing the shellfish in chlorinated water, the water shall contain throughout this process at least 0.5 p.p.m. of available chlorine.

5. All shellfish shall be thoroughly culled or inspected before filling the containers used for treatment purposes, and all shellfish shall again be thoroughly culled or inspected after treatment. All dead shellfish or shellfish in broken or cracked shells shall be destroyed.

6. Containers used in the treatment process shall be filled under the supervision of the person in immdiate charge, and the containers shall not be filled with shellfish to a depth of more than 8 inches. In filling the containers a clearance of at least 1 inch shall be left between the upper layer of shellfish and the upper rim of the container. Containers used for treatment purposes shall not be used for any other purpose, and no containers or other equipment used on the flats shall be placed in the treatment tanks.

7. When shellfish are taken from several contaminated areas for treatment purposes, those taken from each separate area shall be treated in separate treatment tanks and shall not be mixed with shellfish from other areas.

8. All water in shellfish treatment tanks shall be subjected to chlorine treatment, and no shellfish shall be passed until the same have been treated for at least 24 hours, and for a longer period if the scores of the raw shellfish are 140 or over, in water which shall have been sterilized by chlorine and contain at least 0.5 p.p.m. of available chlorine 15 minutes after application, and the water shall be maintained in a reasonably sterile condition throughout the entire treatment period. Each treatment tank shall be filled with sea water from the usual source at least twice during the treatment period of each lot of shellfish. Determinations of the amount of dissolved oxygen in the water in the treatment tanks shall be made in order to ascertain that oxygen to the extent of at least 30 per cent of saturation is always present. Two or more samples of each lot of raw shellfish and four or more samples of each lot of treated shellfish shall be examined by the Standard Methods of the American Public Health Association for the determination of the *B. coli* score. Records containing the following information shall be available at the treatment plant at all times:

a. Area where shellfish were dug
b. Quantity of shellfish in tank
c. Time of starting treatment.
d. Time of ending treatment
e. Scores of shellfish before treatment, as soon as available
f. Scores of treated shellfish, as soon as available

g. Time and quantities of chlorine applied
h. Available chlorine determinations
i. To whom sold

No shellfish shall be removed from the treatment tanks until the 24-hour results of the untreated shellfish are read.

9. The results of the analyses of all samples, signed by the bacteriologist, shall be sent by mail to the Department of Public Health on each day that the plant is in operation.

10. Treatment plants shall be used for no purpose other than the handling of shellfish, and no shellfish from clean areas shall be handled at a shellfish treatment plant or by the management of such a plant. Material foreign to this particular business shall not be stored within the plant. No person not an employee of the shellfish treatment plant or a representative of the Department of Public Health or Department of Conservation shall be allowed access to the treatment plant or to the laboratory except by permission of the person in charge. All shellfish treatment plants shall be provided with suitable toilet facilities.

11. A portion of the plant may be used for shucking purposes, and the operation of this portion of the plant shall be under the supervision of the person in charge of the plant. Such a shucking plant shall be constructed and operated in general accordance with the U. S. Public Health Service Minimum Requirements for approval of State Shellfish Control Measures and Certifications for Shippers in Interstate Commerce.

12. Only clean containers shall be used for shipping treated shellfish in the shell. If bags are used for this purpose all such bags shall be sterilized before being used. Only non-returnable, clean containers shall be used for shipping shucked shellfish.

13. If the shellfish are shipped from the plant in the shell, the shipping containers shall be suitably sealed and marked as "Passed. ..... shellfish treatment plant." If the shellfish are shucked at the plant, the shipping containers shall be suitably sealed and marked as "Passed and Shucked ..... shellfish treatment plant."

14. All other rules and regulations prepared by this department or by the Supervisor of Marine Fisheries of the Division of Fisheries and Game relative to shellfish shall be followed in the operation of all shellfish treatment plants. The Department reserves the right to change the above rules and regulations from time to time as occasion may require without notice.

THE OXIDATION POTENTIAL CONCEPT OF CHLORINATION *

F. C. SCHMELKES

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MEASUREMENTS were presented of the oxidation potential in solutions of hypochlorous acid, chloramine, monochloroglycine and Azochloramide. These measurements were compared with measurements of the rate of bacteria removal. The oxidation potential and bactericidal properties of chlorine were found to run parallel. Any changes which diminish bactericidal velocity also diminish the oxidation potential, and *vice versa*.

Attention was drawn to the failings of the orthotolidin test as the reagent reduces the pH of the solution to be measured, due to the large amount of hydrochloric acid in the reagent, and thereby increases the oxidation potential to a high value. This test essentially measures the amount of chlorine which can be converted into bactericidal and sterilizing chlorine by lowering the pH. The test therefore does not distinguish between chlorine

* Abstract of paper read before the Public Health Engineering Section and Conference of State Sanitary Engineers at the Sixty-first Annual Meeting of the A. P. H. A., at Washington, D. C., October 24, 1932.

compounds of high and low oxidation potential.

Attention is drawn to the fact that in the ammonia-chlorine process advantage is deliberately taken of the reduction of the oxidation potential to prevent combination of chlorine with phenols, to prevent oxidation of organic matter thus increasing persistency of the residual, and that this is being done at the expense of bactericidal velocity.

A motion picture was presented, showing the slow death, cessation of movement, agglutination, and disintegration of typhoid bacteria, brought about by treatment with low potential chloramine compounds.

INDUSTRIAL HYGIENE

Division of Occupational Diseases, Connecticut, Annual Report, 1931—This *Annual Report* of the Connecticut State Health Department, 1931, carries 52 pages devoted to the Division of Occupational Diseases, headed by Dr. Albert S. Gray.

During the course of the year, 391 cases of occupational diseases were recorded, only 141 of which, however, were reported by physicians. "Occupational disease is almost entirely preventable, yet it is now costing Connecticut industry millions a year in decreased production, compensation, and medical claims."

There is a discussion of the health relationships of dust, fumes, gases, and toxic materials, ventilation, illumination, sanitary facilities, industrial fatigue, maintenance and supervision. During the year the division made a total of 267 field trips, including 72 surveys of plant conditions. A code is used to classify both hazards and industrial pursuits.

Special studies were made of: (1) soapstone dust exposure, which showed that workers were exposed to an excessive amount of dust; (2) dust hazards of sandblasting; (3) dustiness in wood working operations associated with both dermatitis and pneumoconiosis; (4) foundry dust; (5) lead exposure in brass foundries, which showed that lead present in dust samples was well below the amount that would constitute a lead hazard as defined by the A.P.H.A.; (6) mercury poisoning, in which it was concluded that the average individual would develop symptoms under the conditions found within a period of several months; (7) carbon monoxide, in which it was found that this gas frequently exceeded toxic limits; (8) exhaust ventilation of spray coating booths, where low velocities were found which might result in poisoning; (9) carbon tetrachloride in dry cleaning in which the discussion relates principally to methods of estimating low concentrations—0.16 per cent being taken as the lower toxic limit; (10) a method for determining benzol vapors; (11) simple preventive measures in connection with dermatitis from soap solution and from cyanide hardening operations; and (12) suggested regulations concerning fumigation with cyanide gas.

There is also a brief review of the Eastern Interstate Conference on Labor Legislation called in June, 1931, by Governor Pinchot of Pennsylvania, and held in Harrisburg. The division likewise carried on various educational activities, held an industrial hygiene exhibit at the New Haven Industrial Exhibition, and entertained a number of foreign visitors. A list is given of the occupational diseases reported, by cause and compensability. E. R. H.

Employed Boys and Girls in Milwaukee—In 1920, there were 4,617 employment certificates issued in Milwaukee to children of 14 and 15 years, and 1,190 to children of 16 years who went to work during school hours for the first time. Corresponding figures for the 12 months ended December, 1924, showed 1,926 and 1,080 certificates respectively. In 1925, there were 8,930 employed boys and girls enrolled in vocational schools from 14 to 18, inclusive.

Special tables show the nature of the first occupation and the occupation at the time of inquiry. In 1925, manufacturing and mechanical industries included 2,140 boys and 2,180 girls; transportation, trade, and clerical, 1,348 boys and 1,033 girls. (The report contains a considerable amount of statistical and other information concerning work relationships of these minors in a city where there are rather advanced regulations concerning the age and nature of employment and apprenticeship.)—Alice Channing, *Publication No. 213,* U. S. Children's Bureau, Washington, D. C., 1932.

E. R. H.

Division of Industrial Hygiene, Ontario Department of Health, 1931—In this *Annual Report,* the Workmen's Compensation Board referred for diagnosis, during the year, to the Division of Industrial Hygiene, 141 cases of alleged silicosis and 32 cases of lead poisoning.

Surveys were made of workers exposed to dust involving 450 examinations with X-rays in connection with grinding, polishing, porcelain manufacturing, moulding, and the preparation of abrasive cleaners.

A small group of workmen in batch rooms of glass bottle manufacturing were examined. These handled sand, lime, and soda ash. Despite the fact that exposure was high and for periods as long as 9 years, only early lung changes due to silica were present.

In a group of 12 men preparing abrasive cleaner, all for 9 years or more, with heavy exposure to silica and alkali, there were but 2 cases of early silicosis and 2 cases of tuberculosis—1 of them moderately advanced after 17 years. "The findings in these groups suggest that simultaneous exposure to silica and alkali can take place without the rapid development of silicosis which has been reported elsewhere."

Workers exposed to a high concentration of gypsum dust showed no increased fibrosis of importance. Of 8 men exposed to asbestos dust, 3 showed minor lung fibrosis and 1 moderately advanced with no tuberculosis—the longest exposure being 11 years.

Benzol poisoning in the process of doping in patent leather manufacture resulted in 2 deaths and 2 cases with recovery; 3 workmen suffered minor effects; concentration of benzol in the dope as used was 47 per cent.

Bakelite dust, a condensation product of phenol and formaldehyde, showed no abnormality in eye examinations. Perionychia was observed in girls plucking chickens.

The 6 major causes of death—heart disease, tuberculosis, cancer, accidents, pneumonia, and Bright's disease—should be investigated, not in hospitals and clinics, but among comparatively well people, for whom plant medical service provides an opportunity.—J. Grant Cunningham, pp. 47–49 (see citation above), 1932. E. R. H.

Cautionary Notices—The British Department of Factory Inspection provides a considerable series of official cautionary notices to be displayed in workplaces and explained to employees. The following are examples:

Dermatitis (Form 367, April, 1928)—A placard illustrated with two half-tones; prevention, removal of stain from the skin, cure.

Dermatitis (Form 355, May, 1928)—A general notice describing dermatitis, its ordinary prevention and cure.

The effects of chrome on the skin (Form 398, Aug., 1930)—Chrome holes, chrome ulcers, precautions, dermatitis, effects on the nose, a recommended ointment, also a recommended nose wash.

Effects of lemon and orange peeling on the skin (Form 396, July, 1931)—"Acid holes" from the juice of these fruits, preventive measures before, during, and after work, recommended ointment, also water-proof plaster.

Hides and skins regulations, 1921 (Form 982a, Jan., 1922)—Warning to workmen concerning open cuts, scratches, pimples, etc., sticking plasters, care of hands and nails, food, and clothing.

Anthrax (Form 410, Jan., 1932)—Large placard carrying 9 reproductions in color of the development of anthrax infection in the skin from the first to the fifth days, with a description of the disease, its source, precautions about breathing and swallowing dusts of infected materials, and use of serum; also, addresses of agents supplying serum.

Celluloid fire dangers (Form 987, Jan., 1928)—Warning to workers and methods of control.

Carbon monoxide (CO) poisoning (Form 932, Oct., 1931)—Description of the gas, sources of poisoning, symptoms, first aid, artificial respiration by the Shafer method, with a reviving apparatus (illustrated).

Dangers from gassing or burns (Form 395, Jan., 1927)—Chemical regulations, breathing apparatus and life-belt, symptoms, general treatment; special treatment in the case of nitrous fumes, chlorine, sulphurous fumes, sulphuretted hydrogen, benzene and similar volatile bodies, carbon monoxide or producer gas, carbon dioxide. Also, how to apply artificial respiration by the Shafer method, with oxygen apparatus. Also, chemical burns of the skin and of the eye. Splashes of anilin or nitro-benzene.

The above may be secured at a price of a few cents each from the British Library of Information, 270 Madison Ave., New York, N. Y. E. R. H.

The Equivalent Temperature of a Room and Its Measurement—The author proposes the name "equivalent temperature" for the combined effects of dry-bulb temperature and radiant temperature present at any particular point, and gives a description with illustrations of the eupatheoscope, a form of radiometer devised to record this combined or true temperature.

The author finds that neither the kata-thermometer nor the effective temperature renders a true report of the sensation effect as found by the eupatheoscope. The eupatheostat is an automaton for regulating the heating of a room or space.

With the instrument, the author finds that, at 65° F. equivalent temperature, the average skin temperature is then accurately 75° F. A sedentary worker, with his output of 17½ B.t.u. per sq. ft. per hr., finds comfort in an equivalent temperature of 65° F., while a man engaged on light industrial work may lose heat at twice this rate and be comfortable in an equivalent temperature of 55° F.—A. F. Dufton, *Technical Paper No. 13*, 9 pp., Building Research, H. M. Stationery Office, 1932. Procurable from British Library of Information, 270 Madison Avenue, New York, price 6d net. E. R. H.

Cyanide Poisoning in San Francisco—After describing 3 case reports illustrating the unsatisfactory methods now empirically followed in the emergency treatment of acute cyanide poisoning, a new treatment was used at the Park Emergency Hospital, which undoubtedly saved the life of the young man in question.

On September 5, 1932, the victim was brought to the hospital by friends who stated that he had taken poison and told them of it immediately thereafter. On admission he was comatose; showed spasms of the voluntary muscles with moderate opisthotonos and extreme hypertension of the hands and feet, the pupils were contracted and sluggish in their reaction to light; respiration was slow and regular. There was a bright vermilion hue to the lips and a peculiar odor (simulating

paraldehyde or chloral) of the breath. Gastric lavage with sodium bichromate was begun. The washings had the odor of cyanide.

An intravenous injection of 50 c.c. of a 1 per cent sterile aqueous solution of methylene blue (methylthionine chloride, U.S.P.), was begun. "Within a very short time, voluntary movements were noted, and before 5 minutes had elapsed, the man was conscious and appeared to be essentially normal except for a severe chill and an apparent flushing. Recovery was complete within 15 minutes."

An analysis of the gastric content corresponded reasonably closely with the patient's statement that he had taken 15 grains of potassium cyanide in about 4 ounces of water.

The use of methylene blue and other dyes in the study of biologic oxidation and reduction processes is not entirely new. Warburg began an extensive study years ago, publishing reports as early as 1910, and is still investigating the subject. The favorable reaction noted in animals by others prompted Hanzlik and Leake to recommend this treatment.

There is also evidence in the literature to warrant the use of methylene blue in carbon monoxide poisoning.—J. C. Geiger, *J.A.M.A.*, 99, 23:1944–5 (Dec. 3), 1932. E. R. H.

"Pneumoconiosis"—This is a special bibliography of works published up to December, 1931, on the general physiology and pathology, clinical pathology, and radiology of pneumoconiosis. The publication is intended as a preliminary step leading toward the compilation of a full bibliography.—Procurable from World Peace Foundation, 40 Mt. Vernon St., Boston, Mass. E. R. H.

"Occupation and Health"—Brochures No. 303 to 315 in this Encyclopaedia of Hygiene, Pathology and Social Welfare, have now appeared, completing the subjects to be covered through the letter "O."

This group of Brochures includes the following: Paper Industry, Perfume and Essence Industry, Phenols, Photo-Engraving, Seamen (Pathology and Hygiene of), Silos (Work in), Sodium, Straw, Sulphur, Tantalum, Ultramarine, Vocational Guidance and Selection, and Welding, Autogenous.—International Labour Office, Geneva, 1932. Procurable from the World Peace Foundation, 40 Mt. Vernon St., Boston, Mass. E. R. H.

Alternating Current Precipitators for Sanitary Air Analysis—

1. An inexpensive precipitator unit.—Philip Drinker.

By the use of a luminous tube transformer intended for operating neon signs a simple inexpensive electric precipitator has been built. The total cost of this precipitator is slightly less than $30.

2. Acid Formation in Electric Precipitators.—W. G. Hazard and T. Ishikawa.

The authors found that acids of nitrogen were formed in electric dust precipitators when the voltage, rate of air flow and tube diameter were within certain limits. This may invalidate determinations when chemical methods of estimation are used. Adjustment of the previously mentioned factors will serve to eliminate the errors of acid formation. *J. Indust. Hyg.*, XIV, 9:364–370, 1932. L. G.

Toxicity of Dichlorotetrafluoroethane—Dichlorotetrafluoroethane ($C Cl F_2 . C Cl F_2$) is one of the newer chemical compounds which, because of its properties, is suitable for use as a refrigerant gas. In the present study dogs and guinea pigs were exposed to 20, 15, and 14.16 per cent concentra-

tions of the gas in one of the gassing chambers of the U. S. Bureau of Mines. On exposure to the 20 per cent vapor, generalized tremors, intermittent convulsions and finally exhaustion took place, while the exposure to 15 and 14.16 per cent concentrations caused some incoördination, generalized tremors, and occasional convulsions, which disappeared after three to five exposures to the gas.

With cessation of exposure of dogs to the 20 per cent concentration for a single 8-hour period rapid and complete recovery took place; death followed longer exposures than this. Guinea pigs, on the contrary, were not seriously affected by four 8-hour exposures or one 24-hour exposure to this concentration of the vapor.

In contrast with the 20 per cent concentration the 15 and 14.16 concentrations led to the development of a high degree of tolerance in dogs after three or five consecutive 8-hour daily exposures. No deaths occurred during 21 consecutive exposures at this concentration. For details concerning the blood changes and pathology the reader is referred to the original contribution.

It is concluded that dichlorotetrafluoroethane is an organic vapor of remarkably low toxicity.—W. P. Yant, H. H. Schrenk and F. A. Patty—U. S. Bureau of Mines *Reports of Investigations* 3185. L. G.

Protection Against Mercury Vapor Afforded by Cannister Gas Masks—Two charcoal filled gas-mask cannisters, three type N gas-mask cannisters and two charcoal filled respirator cartridges were tested to determine their protective efficiency against mercury vapor. The concentration of vapor was 42.5 p.p.m. by volume.

The charcoal filled cannisters had a life of 112 and 117 minutes, the three type N cannisters ranged from approximately 15–36 hours while the respirator cartridges has a life of only 2 minutes. Rest intervals increased the useful life of the cannisters.—W. P. Yant and C. E. Traubert—U. S. Bureau of Mines *Reports of Investigations* 3187.

L. G.

FOOD AND NUTRITION

Soft Curd Milk—Hill in 1928 (*Bull. 227,* Utah Exper. Sta.) reported a test for measuring the difference in toughness of curds in cow's milk. Any milk with a curd tension of less than 30 gm. he called "soft curd milk" and all above 30 gm. "hard curd milk." This standard has been adopted by the New York City Health Department.

It has been suggested that soft curd milk is better tolerated by infants than is hard curd milk, and this is the report of an experiment carried out at Bellevue Hospital. Eighty-two infants, under 1 year of age, over 90 per cent of them under 6 months, were selected at random except that preference was given to small and underweight infants. The infants received soft curd milk for a period of from 10 to 90 days with an average of 21 days.

After the milk had been in the infant's stomach for 15, 30, and 60 minutes, the size and consistency of the curds were compared with those in the curds from certified milk (boiled and unboiled), evaporated milk and breast milk. Contrary to previous findings by Hill, soft curd milk showed a higher percentage of hard curds than did boiled milk. The curds were softer than those after taking unboiled certified milk, about equal in size to those of boiled milk, but larger and tougher

than those of evaporated or breast milk.

In this group of infants receiving soft curd milk instead of ordinary certified milk, 54, or 65 per cent, gained weight at the expected rate of healthy babies. The average caloric intake for these babies was 61 calories per lb. Twenty-one babies lost weight and the average caloric intake was 51 calories per lb. The chief cause of failure to gain was vomiting and diarrhea. Soft curd milk was of no special value in preventing or treating vomiting and diarrhea. It was shown that soft curd milk has no decided advantage over other certified milks in its digestibility. The infants given soft curd milk needed a higher caloric intake than those given other milks—Herbert L. Elias, *Am. J. Dis. Child.*, 44:296 (Aug.), 1932.

The Antirachitic Potency of Eggs from Hens Receiving Massive Doses of Activated Ergosterol — Fifteen Leghorn pullets receiving a normal ration were used in this experiment. They were kept away from the sunlight and received the ration from January 20 to March 17. During the last week, the eggs were collected for testing.

On March 18, 2 per cent of cod liver oil which was contained in the ration was replaced by 2 per cent of maize oil solution of activated ergosterol. After the birds received this dosage of vitamin D for 6 weeks, the eggs were again collected for testing. The egg yolk oil from the pullets receiving the cod liver oil had a vitamin D coefficient of 0.7.

The substitution of an irradiated ergosterol 10,000 times as potent as the cod liver oil resulted in an increase of only 185 times in the antirachitic value of the egg, indicating that the birds did not transfer the vitamin to the yolk efficiently. During the administration of the ergosterol the pullets lost about 20 per cent in weight and the general appearance was poor.

On continuing the administration of 2 per cent of 10,000× activated ergosterol solution for an additional 44 days, a further decrease in weight and egg production was noted. Three birds died and only 43 eggs were laid. The egg yolk oil from the pullets receiving the ergosterol was administered to baby chicks at levels equivalent to 2 per cent, and to 25 per cent of cod liver oil. It was found to be less effective than 2 per cent of cod liver oil for preventing leg weakness in chickens.

Additional experiments are being carried out to determine whether the source of vitamin D available to laying birds determines the antirachitic value of the vitamin D that will be stored in the egg.—Francis G. McDonald and O. N. Massengale, *J. Biol. Chem.* 99:79 (Dec.), 1932.

Studies on Vitamin G (B_2) With Special Reference to Protein Intake —Most of the work on the nutritional treatment of pellagra has been in connection with vitamin G, following the work of Goldberger and his associates. The suggestion that protein bears a relation to this problem is responsible for undertaking experiments recorded here.

Vitamin G was prepared from ground whole wheat with extraction of 84.5 per cent alcohol by weight. The dried residue was incorporated in the diet so that 1 kilo contained the extract from 500 gm. of wheat. Protein at 6, 12, and 18 per cent levels was fed, the protein being derived in one series from casein previously extracted with alcohol and in the second from milk powder plus extracted casein. The only source of vitamin B, except that naturally present in the animal, came from the wheat extract.

In both series of protein variations the average growth increased with the protein intake, the differences between the 6 and 12 per cent levels being much

greater than between the 12 and 18 per cent.

An additional experiment on 6 per cent protein containing an excess of vitamin G as protein-free milk showed a much higher growth rate than any of the others.

The authors conclude that while pellagra conditions indicate symptoms of vitamin G shortage, the vitamin deficiency should not be regarded as the sole factor but that the relation of the protein supply should also be taken into consideration.—H. C. Sherman, and I. A. Derbigny, *J. Biol. Chem.* 99:165 (Dec.), 1932.

Vitamin C Content of Frozen Orange Juice—Stored orange juice has been tested both chemically and biologically to determine whether there is a deterioration of the vitamin in freezing, during storage, and whether atmospheric oxygen influences its stability in either process.

The extracted juice was prepared in 3 ways, in air and freezing under air head spaces, in nitrogen and freezing under nitrogen, and extraction in air and freezing under oxygen, the first 2 methods comparing with the ordinary commercial practice.

The juice of Florida Valencia oranges was placed in ampules, frozen and stored. Assays were begun shortly after the juice was frozen and then compared with the results obtained from the juice stored 10 months. One and one-half c.c. of the juice preparations were given daily compared with the same amount of fresh juice from reserve oranges, while another group received no vitamin C. The average survival of the negative controls was 26 days with symptoms of scurvy showing before 2 weeks. There was scurvy evidence on post-mortem. No significant difference in growth was observed between fresh juice or any of the 3 types of fresh frozen juices. There was no difference between the tests using fresh frozen juice and that using the frozen juice stored for 10 months.

To determine the antiscorbutic potency of the preparations, 0.01 N solution of 2, 6-dichlorophenol-indophenol was used to titrate portions of the juice with this dye after neutralizing with sodium acetate. Titrations showed some difference between the juices frozen under nitrogen, oxygen and air respectively. The orange juice was further treated to isolate the reducing substances. The reducing concentrate was diluted with water so that 0.5 c.c. had a reducing value equivalent to 2 c.c. of orange juice as determined by titration. Glucic acid with a reducing property similar to that of hexuronic acid was dissolved in water so that 0.5 c.c. portion contained 2 mg. of the acid. By titration this amount was equivalent in reducing value to about 7 c.c. of orange juice. On feeding this amount to guinea pigs the animals on glucic acid as well as the negative controls developed scurvy; post-mortem showed all animals in these groups to have severe scurvy.

Another group received 5 c.c. of diluted orange juice concentrate. The orange juice and the juice concentrate groups were in excellent condition at the end of 5 weeks when the supply of juice and concentrate was exhausted. While the colorimetric titration in orange juice may be a useful guide as to vitamin C potency, there are apt to be present in plant material reducing substances having no antiscorbutic value.—E. M. Nelson and H. H. Mottern, *J. Indust. & Eng. Chem.* 25:216 (Feb.), 1933.

The Nutritive Value and Efficiency of Mineralized Milk—Whole milk mineralized with iron, copper and manganese was fed to male rats 21 days old. These elements were added as solutions of $FeCl_3$, $CuSO_4$, and $MnCl_2$

so that 30 c.c. of milk contained 0.5 mg. Fe, 0.05 mg. Cu, and 0.04 mg. Mn. The rats grew from 60 to 200 gm. in 36 days, or an average daily gain of 3.9 gm. which is similar to the gain made by rats on an ordinary ration. Only 2.25 gm. of milk solids were necessary to produce 1 gm. of gain in weight.

A similar experiment was made with pigs. Ten young Yorkshire pigs were used. A solution containing 50 mg. Fe as $FeCl_3$, 5 mg. Cu as $CuSO_4$, and 5 mg. Mn as $MnCl_2$ was added daily to the milk given each pig. Twenty-five c.c. cod liver oil were given once a week to insure vitamin D. The pigs were weighed every 4 weeks, and made a daily gain of 1.26 lb. over a period of 16 weeks. Only 1.97 lb. of milk solids were necessary to produce 1 lb. gain in weights, while 3.53 lb. of the standard ration were necessary for the same gain.

In this paper the authors have merely demonstrated the possible importance of mineralized milk in experimental work, and have suggested that if the mineralization of milk is to be used under practical conditions the simplest and most efficient method of supplying these elements must be worked out in the future.—A. R. Kemmerer, C. A. Elvehjem, E. B. Hart, and J. M. Fargo, *Am. J. Physiol.* 102:319 (Nov. 1), 1932.

Pasteurization of Milk Artificially Infected With Two Strains of Brucella Suis—Investigations of recent years have shown that cattle may be infected spontaneously or artificially with Brucella strains of the porcine type, that porcine strains may become established in the mammary glands of cows and be eliminated in the milk, and that *Brucella suis* may be isolated from the blood of undulant fever patients. The susceptibility of cattle and man to porcine Brucella suggests the possible occurrence of a milk-borne, porcine Brucella infection in man, and emphasizes the importance of determining the thermal death time of different strains of *Brucella suis* in order to appraise the reliability of milk pasteurization standards in the prevention of these infections.

Reported studies on the thermal death time of Brucella strains indicate that a temperature of 140° F. for a shorter time than that presented for pasteurization renders Brucella nonviable, but indicate that porcine strains are more resistant than bovine or caprine varieties.

The authors have studied the heat resistance of two strains of porcine Brucella in samples of milk in cotton-stoppered tubes and hermetically sealed glass tubes. Samples of whole and skim milk in cotton-stoppered tubes with a content of Brucella organisms ranging in the various tests from 5,000 to 500,000,000 per c.c. were subjected to a temperature of 144° F. for 30 minutes. Samples of whole milk in hermetically sealed glass tubes with a content of 100,000,000 Brucella organisms per c.c. were subjected to a temperature of 144° F. for varying periods of time ranging from 2 to 30 minutes, and similar samples with a content of 500,000,000 organisms per c.c. were subjected to temperatures of 134, 140, 142, and 144° F. for the same time intervals.

Results of these tests show that the strains tested are more resistant to heat in cotton-stoppered tubes of milk than in hermetically sealed glass tubes. In the former, *Brucella suis* survived 30 minutes at 144° F. in milk containing 10,000,000 to 500,000,000 organisms per c.c. but the same period of time and same temperature destroyed *Brucella suis* in milk containing from 5,000 to 1,000,000 organisms per c.c. Both strains of *Brucella suis* in hermetically sealed glass tubes of whole milk containing 500,000,000 organisms per c.c.

were non-viable after 20 minutes at 140° F., after 15 minutes at 142° F., and after 7 minutes at 144° F.

The authors suggest that the resistance of the organisms in cotton-stoppered tubes may be due to the formation of a dry film in which the organisms survive, this film not being formed in the sealed tube.

It appears that the thermal death time is influenced by the degree of contamination.

The authors cite the work of other investigators which tends to show that the number of organisms encountered in milk is relatively small in comparison with the massive inoculations used in this experimental work. The data obtained suggest to the authors that efficient pasteurization will prevent milk-borne porcine brucelliasis, but they withhold final conclusions pending results of studies on commercial pasteurizers.—S. E. Park, Robert Graham, M. J. Prucha, and J. M. Brannon, *J. Bact.*, 24:461 (Dec.), 1932.

CHILD HYGIENE

PARENTAL EDUCATION AND CHILD HYGIENE

WE are reminded constantly that organizations and technics of themselves cannot accomplish results in the child health field. Application depends upon the knowledge and active participation of parents and children. This is well illustrated in the infant welfare movement in this country and abroad. The mothers have been taught by public health nurses, and with simply-worded literature, to take advantage of the public health facilities and apply them to the individual child.

Considerable advances have been made in the physical care of the child. It remains to extend the same principles to cover its mental development. In a most challenging recent book on parental education * Mrs. Gruenberg has laid down certain governing principles.

The most obvious and the most widely accepted educational service for parents has to do with the physical care of children. So completely has the present generation of adults accepted its dependence upon a variety of experts for assistance in the physical care of children that this kind of help is often quite overlooked when people think of parent education. When a mother gets advice on her own diet while nursing her infant, that is all in the day's work for the nurse or the pediatrician. When, years later, she obtains from other adults (who have perhaps had more experience) counsel on the management of that same child, that is parent education. But in all essential respects the former is quite as much "parent education" as the latter.

Similarly we have accepted the lectures and radio talks and printed matter on the hours of sleep or the treatment of scratches and burns without labeling the valuable instruction as "parent education." We have merely taken such help on the common-sense ground that it enables us to do our work more effectively. There are better ways of managing our affairs, as parents; and we want to find out what those better ways are. We have accepted the principle, then, that everything helpful to such better ways is parent education.

The symposium which appears in this volume is composed of short chapters written by leaders in their respective fields and covers practically every phase of child growth and development, and the relation of the child to the home, school, and broader contacts of the outside world. If one has not been convinced already that parental education as an integral part of adult education

* *Our Children*, a handbook for parents, by Dorothy Canfield Fisher and Sidonie Matsner Gruenberg. Prepared and sponsored by the Child Study Association of America, 1932.

is vital to the physical and mental well-being of the child, a perusal of this book will remove any doubts.

As a background to this and similar efforts in parental education, it is enlightening to trace the history of parent associations in this country. This has been sketched in *A Contribution to the Theory and Practice of Parents Associations,** which is a discussion based on a 5-year experiment made by the United Parents Association of New York City from 1925 to 1931.

In the foreword Mr. Lindeman cogently says that

> . . . modern parents are perturbed because they find themselves incapable of exercising the functions of parenthood on the basis of either native equipment or traditional knowledge. They find that their very young children need a kind of attention which calls for new knowledge and fresh comprehension. They also discover that the influences which play upon their developing children in dominant fashion originate, not within the family group, but in the surrounding community and its institutions. The most important of these institutions is, of course, the school. Approximately twenty million American children spend from 4 to 8 hours each day away from home and at school. These hours away from home and family are filled with stimulations which combine to form the child's personality. Parents have come to realize that they can only become effective in their parental rôles if they understand and collaborate with the institution which plays so significant a part in the development of their children, namely, the school. But, how is such understanding to be acquired and by what means is such collaboration to be achieved?

An attempt has been made to answer this question by the experiment sponsored by the United Parents Associations of New York City.

> In 1925 the Executive Committee of the United Parents Associations of New York City formulated the theory that this new knowledge would produce most desirable results in social action if it were disseminated in such a way that the two institutions most profoundly influential in the child's development, the home and the school, felt its impact simultaneously. As a corollary of that theory, it followed that Parent-Teacher Associations should be a medium for "parent education." . . . It is apparent to any one who carefully studies the parent-teacher movement that it has potential possibilities for playing a significant part in our present complex civilization. But the problems connected with converting those potentialities into reality are not simple and are not to be solved by rule-of-thumb methods or mere common sense.
>
> Where is the growing individual to find interpretation and integration? Some psychologists answer these questions by saying that only the parents' influence is sufficiently continuous to guide the child toward a philosophy and to resolve the contradictions in his environment; that the home is the only place where he can feel secure and retire from the world to refresh his powers.
>
> But in too many cases today parents have no educational technic for undertaking this delicate adjustment. Two many parents for lack of training ignore the child's problems or meet his questions with indifference or hostility. The psychologists contend that such ignorance on the part of parents results in much of the maladjustment and unhappiness which are a matter of common observation in so-called normal human life today and that it is possible that many of the extreme neurotic and psychopathic conditions which send people to reformatories, insane asylums, prisons and divorce courts, may be traced to the parents' lack of understanding and skill.

A most important point is stressed in discussing the application of modern psychology to the formal education of our children. The report states that

> . . . although it is true that to date the findings of modern psychology have not revolutionized our school systems, public or private, minor changes in theory and some changes in practice have resulted. All of these point to the necessity for parent education. It is becoming apparent to the professionals in charge that a narrow concept of education, designed largely to prepare children for material success and based on drilling them in facts, involves stultification of individual values and does not fit them for creative participation in the great variety of possibilities inherent in human life. Therefore, the course of study in the new type of "progressive" school is attempting to deal not only with facts but also with free expression and development of individual

* By Maria Lambin Rogers with a foreword by Eduard C. Lindeman. Printed for the United Parents Associations of New York City by The Curative Workshop, 28 East 21st Street.

interests and curiosities. This broadened conception of education requires that principals and teachers know the whole child, a desideratum made possible only through the interest and support of the educated parent.

Certain principles of method are laid down for the conduct of mothers' clubs or parent-teacher associations. These are listed as follows:

"The first of these was that the parents in each school form the logical groups through which to work inasmuch as group learning, when attitudes are to be changed, is more effective than individual learning.

"Second, the results of group learning register themselves automatically in the conduct of any institution of which the group is a functional part.

"A third principle was that the autonomy of these groups must be kept inviolate.

"A fourth principle was that such energies and powers as the individual possesses will not develop in a cramped atmosphere where values are rigid and authoritatively determined.

"A fifth principle was that leadership for every parents association should be drawn from the local community.

"A sixth principle was that such alert and well-trained groups exert the maximum influence in the community if united in a federation.

"A seventh principle was that the work of the federation should not duplicate the work of any other organization in New York City, where so many agencies are concerned with civic welfare.

"An eighth principle was that the policies and work of the federation should be guided by the experience of the experts in the field of social science and that it should affiliate with these experts and give them influence in every possible way.

"A ninth principle was that the federation should be city-wide in character and should be representative of all the organized parents of the city, both in private and public schools. It has, therefore, accepted for membership Parent-Teacher Associations, Mothers' Clubs or Kindergarten Mothers' Clubs, organized in connection with any school, private or public. It has encouraged the representatives of the private schools to take as active a part in the central federation organization as is taken by the representatives of the public schools."

In laying out an immediate program for the next 5 years the United Parents Associations have grouped their activities under 4 main headings:

I. Coördination of the work of the member associations;
II. Establishment and maintenance of needed services;
III. Building of prestige for parent opinion;
IV. Conservation and evaluation of experience and study of community conditions.

Under the coördination of the work of member associations the following are mentioned:

"A. The School Lunch Committee is to continue with its present program until its objective of adequate school lunch service is attained, which should be within the 5-year period.

"B. The After School Athletic Center Committee is to continue its present program until its objective of adequate supervised play service for children of the elementary schools is attained, which should be within the 5-year period.

"C. Fresh studies of the type made by the School Lunch Committee are to be undertaken. Three promising fields for those studies are: 1. Health service in the schools; 2. Vocational guidance in junior high schools; 3. Mental hygiene clinics for elementary schools. As far as is feasible, preference shall be given to studies popular with the member associations.

"D. The Open School Week Committee is to continue its present activi-

ties. These are to remain a recommended project for member associations.

"E. Early Registration is to continue as a suggested project for member associations when the principal welcomes the help of the association in this work.

"F. A qualitative standard of admission for member associations is to be considered, covering the organization methods and program of activities of the association. These should probably be required to conform to the objective of parental education."

PUBLIC HEALTH NURSING*

Public Health Nurses Take Stock—All public services these days are having to give an accounting of themselves. Public health nursing is no exception. This accounting must show that the service is too valuable to be eliminated; also that the best quality of service is being given for the least possible cost.

The first problem then is to make the public health nursing service indispensable to the consuming public. The only way the public can know our objectives and the plans we have for realizing them is to share actively in a partnership service.

I saw an excellent example of this working partnership in a very rural county that had a nurse with unusual vision. For 3 years the service had developed under her leadership with everyone in the county participating actively—teachers, the P.T.A. groups, women's clubs, men's groups, children—all helping on some project during the course of the year. When a clinic was held for the removal of tonsils, for example, the local paper wrote it up as "our clinic" listing the people who had helped. That list was an interesting one, for it included almost everyone in the community, from the minister who was orderly, to the local physicians who coöperated actively, the teachers who scrubbed instruments, the women who assembled supplies, and the children who ran errands. The third summer while the nurse was away on vacation the bank failed in which much of the community's money was kept, and the county commissioners' meeting hurriedly decided to cut all taxes for the following year as much as possible. Among other expenditures they eliminated the nurse's salary. When this was noised abroad the people protested, organized a citizens committee of the largest taxpayers to meet the commissioners, and finally succeeded in persuading them to put the nursing budget back in the county appropriation. This all happened, as I have said, while the nurse was away on vacation. Much to her surprise on her return she learned that she had lost and regained her position, but much more significant and valuable to her was the evidence that she had developed a real local leadership which would outlast her stay.

Our accounting should start then with a study of our methods and program of work in relation to volunteer service remembering that real progress in public health will come not through what we as professional people know and do but through what we can get others to do for themselves. We must give due credit also for the actual work which these volunteers accomplish. Few communities are able to afford enough public health nurses to develop an adequate program. There is so much that can be adequately done by intelligent lay people.

Every public health nurse should ask herself these questions:

1. What am I doing which does not necessitate a nurse's training?
2. How much that I do can safely be delegated to others?
3. Do I share responsibility for planning and joy of accomplishment?
4. Do I remember to make the work interesting and vital to volunteers?

* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 6 State House Annex, Indianapolis, Ind.

The second problem, so magnified in these years, is to give the best quality of service for the least money.

The first question we must answer is: Is our program based on community needs?

A recent investigator of nursing services reports that the majority of nurses whom she visited (picked because they represented current field practice) could not answer such fundamental questions as these in relation to their own work: the population of the territory served, the annual birth and death rates, the number of babies dying under 1 month and 1 year of age, the number of mothers dying from puerperal causes, the leading causes of local deaths, and the relationship of these facts to the nursing service. How can you justify the cost of your day's work to your community when you neither know the local needs nor are able to measure your accomplishments in terms of those needs?

The administration of the service must be justified also. Both the nurse and her lay board and committees must decide whether they can afford a highly specialized service to one special age or disease group or whether the service should be generalized service on a family basis with more economical administration, by having all similar groups coördinated in one organization.

The question must be answered. "Have all unproductive costs been reduced as far as possible?"

The nurse should lead the way in helping the community to see for what health needs they should provide and how far they fall short. The appraisal forms published by the National Organization for Public Health Nursing and the American Public Health Association set up standards for accomplishments.

How close does the community come to meeting these standards? What plan can we make for the next 10 years which will insure each succeeding year a service which will more nearly meet these standards?

Not only must the administrative and financial program be analyzed but the professional details of each day's work need scrutiny. Does each visit of every day justify itself in results attained? Why are some families uncoöperative? How many repeat visits are profitable when our funds limit the extent of our service?

Do we study records in the light of our successes and failures and make plans accordingly? Do we plan each visit carefully and afterwards critically appraise it?

The public health nurses, more fortunate than other nursing groups, are better organized, more regularly employed and more accustomed to working with lay groups. They then should assume leadership in their communities in analyzing professional problems other than those involved in their day's work. Is your community aware of the oversupply and under employment of nurses? Are they making plans so that all those who are sick can receive the services of nurses who need work at a price satisfactory to both parties? Do high school girls know the facts about nursing as a vocation? Do teachers and vocational advisers know that only their best graduates are welcome in the nursing schools?

Certainly at no time than when we are facing problems like these have we greater need of our national organizations. The American Nurses' Association and the National Organization for Public Health Nursing are making studies, giving us standards by which to measure our accomplishments and fighting for rights which affect every one of us as individuals in a profession which is striving to develop an increasingly superior service.

They need our support in membership and in subscriptions to the magazines.

Out of this period of economic stringency, the nursing profession can, if it will, develop a quality of service far superior to that which it has rendered in the past; but it will ac-

complish this only as we all resolve to give to each hour of every working day the most intelligent, thoughtful quality of service that we are capable of—setting up within ourselves standards of work which will be satisfied only with our best, and developing a habit of planning, questioning, and measuring all that we do in terms of meeting the concrete needs of *our* community.

Katharine Faville, R.N. Problems in Public Health Nursing, *Pub. Health*, Michigan Department of Health, XX, 12:267–275 (Dec.), 1932. V. A. J.

Health Integration in High School—Public health nurses are always searching for ways of integrating health with other subjects so that they may give helpful suggestions to teachers. Especially precious are suggestions for integration in high schools where each special teacher has a particular angle from which she may approach health teaching.

Two helpful suggestions come from Great Neck, N. Y., a town of 5,000 people where everyone seems to be enrolled in the Health League, if not as a member at least as a coworker with the community public health nurses.

The teacher of sewing had a style expert from the city come out and talk to the girls on good taste in girls' clothes. The gym teacher called in an expert beauty specialist who told the girls that exercise and fresh air would give them sparkling eyes and red cheeks and that nothing was so ridiculous as a young girl trying to appear like a society woman—unless it was the society woman trying to appear a young girl.

These methods were effective because they conform to the principles of adolescent psychology. The high school boy or girl wants to know the truth, but he wants to make some investigation himself and then draw his own conclusions. These boys and girls want advice, but they do not want advice which is based on sentiment or which is threatening. There must be a clear, logical reason behind it. The adolescent is anxious for a philosophy which will guide and direct his social activities so he may be popular and respected. He wants to be considered an individual with a personality of his own.

Health teaching based on these principles will likely receive the desired response in high school students.—Inez Macaulay, Great Neck, N. Y., What Our Town Does to Keep Us Well. Frankwood E. Williams, *Adolescence*. 1930. D. A. Thom, *Normal Youth and Its Everyday Problems*, 1928.

V. A. J.

An Adequate Community Nursing Service—When the sick people in every rank of life in a community get good nursing care because all varieties of skilled, competent nurses have coördinated their work, that community may be said to have an adequate nursing service.

The medical profession and the general public, as well as the nursing group, must take a hand in the attempt to assure an adequate community nursing service.

Most people divide nurses into three groups, institutional nurses, private duty nurses, and public health nurses.

Private duty and institutional nurses often look on public health nurses as having more freedom because they have regular hours, Sundays free and a regular salary. They do not realize the mental strain involved in shifting from one household to another in the public health nurse's eight-hour day. "No really good field nurse can forget her patients just because the clock strikes four or five p.m." She cannot turn her patients over to a night nurse when she leaves the district at night. Hence she often keeps them on her mind and worries about them.

During the last few bitter years only the gratitude of the poor, the sacrifices that they so willingly make for each other, and the backing of a group of lay people just as eager as the nurse herself to ameliorate the lot of

the unfortunate, have enabled the public health nurse to carry her load.

Physicians and surgeons have been of little help to nurses in demanding minimum standards of good nursing. Nursing groups have been mostly to blame for this because they have not made the medical profession see how much nursing skill is required for certain treatments and how difficult it is to attain this skill if the student nurse has not been well instructed. Have nurses really been candid about sharing their problems with physicians? All good doctors want their patients to get the best nursing care obtainable and they also want the nurses to get a square deal.

One able surgeon who is on the executive committee of a nursing school stated that the best attending staff in the world did less to make the reputation of a hospital than the quality of its nursing service.

Nurses need better organization. Whether they do private duty, institutional or public health nursing, they should be organized under lay groups or advisory committees so that " the older nurse will be sent to those patients who need her special skill and experience, will be paid according to her ability, and will not be expected to compete with the young graduate only a few days out of the hospital."

Behind most groups of public health nurses are keen, interested lay committees, and these committees have been able to work out standards of administration, promotion, standards of work, etc., because they were interested in having the sick poor and wage earners in the community get skilled nursing care.

Hourly nursing should be an appointment service operated by a local registry. Even private duty nurses should be organized through registries into groups graded according to their skill and experience and protected by lay committees.

Nurses must then have the backing of lay groups and physicians in making the cornerstone of their foundation the well equipped, well prepared nurse.

And nursing must show constantly such excellent results that a now somewhat inarticulate public will become vocal in its requirements for good nursing, just as a well organized community demands safe water, safe milk, or the finest type of teaching in its public school system.

Edna L. Foley. Providing an Adequate Community Nursing Service, *Mod. Hosp.*, XL, 1:83–86 (Jan.), 1933.

EDUCATION AND PUBLICITY*

A Correction—"The Full Endorsement of the Advisory Council"—In the February, 1933, *Journal*, we quoted from published statements about a New York Food and Health Exposition announced for April 3–8, 1933. Upon submitting the paragraph to the announced members of the Advisory Council we learned that the matter was under consideration only. *There was no authority for the published statement* which we quoted. Since then it has been decided not to form an advisory committee.

Survey of Health Education—The State Health Council of Indiana has a Survey Committee to encourage a comprehensive study of health legislation, leadership, and facilities. The various sections of the study will be carried on as personnel and funds are available. Progress has been made in the study of the qualifications of special teachers of health and physical education and of instruction methods, under the supervision of H. E. Moore, State Department of Public Instruction, Indianapolis.

The Volunteer Worker—Under this heading appears a tribute to the volunteer from which we quote two paragraphs:

> In looking over our stock in trade and counting up our assets one thing stands out above all the rest; the fact that the foundation upon which the success of the tuberculosis movement has been built is the untiring endeavor and the unselfish expenditure of time and energy on the part of the volunteer workers.
>
> Hundreds of volunteers; the leading business and professional man; the busiest mothers and housewives; active members of Parent-Teacher Associations; Home Economic Clubs workers; Women's Clubs members; all organizations finding time to devote themselves to the betterment of their respective communities' health. They go to make up the township chairmen, the directors, the officers, and the members of the executive committees of our tuberculosis associations. They are the workers who unhallowed and unsung made, and though battered by the winds of adversity are continuing to make, this, the tuberculosis movement, a winning fight against disease.—
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> —*Hoosier Health Herald*, Indianapolis, Dec., 1932.

Health Education in the Philippines—An extensive plan for adult education has been announced by an Advisory Committee appointed by the Governor-General, a member of which is Dr. Jose P. Bantug, chief, Division of Public Health Education and Publicity, Bureau of Health, Manila.

Among the 21 topics suggested for lectures are the following on health: Intestinal parasites, Beriberi and balanced diet, Tuberculosis, Malaria, Infant and child care, Home Sanitation, Skin diseases.

Technical lectures on health to be delivered by insular, provincial, or municipal health officers or school Red Cross, or Puericulture Center nurses, or local doctors.

Read "The Health Talk" If You Talk About Health—Or if you get others to make health talks, you will wish to read "The Health Talk," by Iago Galdston, M.D. If you are chairman of a program committee, or leader or executive of any group which invites the presence of speakers on health topics you will want to read this pamphlet. But it will cause a lot of trouble for some people; you will know so much

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

that will be necessary hereafter to make satisfactory health talks for your audiences. And why have a health talk, or why give one, unless it includes a reasonable proportion of the elements of a good health talk?

Here are the chapter headings: "The Nature of the Problem and the Fundamental Technique of the Health Talk"; "Curiosity, Its Application and Utility"; "Enlisting Interest"; "Imparting Information"; "Mechanics of Delivery"; "Leading to Action"; "On the Air"; "The Health Speakers Bureau"; "The Audience and the Speaker"; "Adjuncts of the Health Talk"; "Giving the Health Talk a Fitting Name." We cannot imagine anyone who talks on health who would not benefit through reading "The Health Talk." And this is one of a very small group of publications that we believe every public and private health agency should possess. Published by National Tuberculosis Association, 450 7th Ave., New York. 76 pp. *50 cents.*

Fewer Words Will Do the Job—The address for purchasing most United States Government publications is "Superintendent of Documents, Washington, D. C." To add "Government Printing Office" merely cumbers the address. The G. P. O. is merely the printing office which prints the publications; the S. of D. is the selling agent.

Neither of the two should be given *for free publications*. Requests for *free* publications should go to the issuing department or other office.

Incidentally, there is now no "Bureau of Education"; it is called the "Office of Education," although the earlier title still appears on publications which have not been reprinted recently.

The Discussion Leader—Confusion as to the actual functions of a "discussion leader" was revealed at the annual fall program session of the National Conference of Social Work. In this October meeting 50 to 60 leaders in social work gave half the day to consideration of reports by "observers" of the sessions at Philadelphia last June.

It was shown that often the so-called "discussion leader" was either a "commentator" on the previous address, or was an "opener" or "starter" of discussion. It was agreed that a "discussion leader" should actually "lead" or conduct audience participation, and that he should not be a speaker.

It was expected that hereafter the following quotation from the new Handbook for Chairmen of Divisions should be the ideal:

> A Discussion Leader for purposes of definition is a person selected to preside during a discussion that is of a more informal character, to keep the discussion related to the subject, to stimulate thinking, and to act as a Discussant himself. This requires considerable ability and facility in handling a meeting and is an entirely different function from that of commenting on a particular paper. A Discussion Leader should be able to think quickly, cheerfully and graciously to shut off a person speaking extemporaneously from the floor on matters entirely irrelevant to the subject, to be at all times in control of the situation, and to be able from time to time to bring out the main lines of discussion or the points being made or to sum up the question at issue clearly for the benefit of the audience. Here again, careful preparation should be made.
>
> The Discussion Leader should be advised in advance as to the purpose of the meeting and what it is hoped to bring out during the discussion. If possible, he should have access to the papers in advance of the Conference and should be permitted to make such arrangements with other individuals for participating in the discussion as he sees fit. The Division Chairman may act as the Discussion Leader but he usually has other responsibilities that prevent his careful preparation for discussion leadership. Unless the Division Chairman or Presiding Officer happens to be exceptionally skillful in leading discussion, it is wiser to select someone else as Discussion Leader (The Chairman is then free for the details of meeting management.)

In this case the distinction between the Discussant and the Discussion Leader should be clearly made to the person selected and at the appropriate time he should be presented to the audience and allowed to have full charge of that part of the meeting at his disposal.

Public Health in "Literary Digest"—There is always the possibility that your better publications may contain material which would appeal to the editor of *Literary Digest*. Selected reports of studies, annual reports, and other publications may be addressed to Arthur E. Bostwick, Science Editor of *Literary Digest*, Park Plaza Hotel, St. Louis, Mo. Please indicate especially interesting or significant pages.

One Hundred New Names—An editorial in the *Journal* (Dec., 1932) calls attention to the significant fact that on the Washington program of the A.P.H.A. "upwards of 100 new names were included as giving papers."

This is testimony to the wisdom and the energy of the various program chairmen. The easy way—repeating the same speakers year after year—is not the way of growth and progress.

RADIO

A successful radio talk service is maintained by the American Child Health Association, 450 7th Ave., New York. Once a month a talk is sent to 170 stations which have indicated a desire to receive the talks. Interested health agencies might check with A.C.H.A. as to use made of these talks by stations in their territory. *Copy free.*

Copies of a series of radio talks on mouth hygiene will be sent upon request to New York Department of Health, 139 Centre St., New York.

Radio talks from Illinois State Department of Health, Springfield: "Health Problems of Later Life," "Keeping Well Between 45 and 65," "Prime of Life and Its Health Problems," "Health Hazards of Adolescence and Early Maturity," "Sick Headache, Asthma and Hay Fever Victims," "The Healthiest Period of Life."

COÖPERATING GROUPS

The Massachusetts Society For Mental Hygiene, 3 Joy St., Boston, held a 3-day course on mental hygiene for Massachusetts girl scout leaders.

The Health Section of the Albany, N. Y., Council of Social Agencies has arranged a series of talks on "What The Social Worker Should Know About Disease."

"Health And Its Maintenance" is a reading list: "The Public Library Offers You These Books," says *Brookline Health Bulletin*, Brookline, Mass., Board of Health., Dec., 1932. *Sample free.*

NEW

High School Health Bulletin and *Child Health Study* are now issued in addition to *School Health Bulletin*, by Illinois Tuberculosis Assn., Springfield. All are attractively mimeographed on clear white paper of 20 lb. weight.

HONORABLE MENTION

To Illinois Tuberculosis Association: for giving date, number of pages, price, and address of publisher for all books offered as reading references in bulletins sent to schools.

HOUSE ORGANS

Of special interest to studious public health workers is the *Quarterly Bulletin*, Milbank Memorial Fund, 40 Wall St., New York. Better ask for a copy to sample its contents before seeking a place on its mailing list. The full-page photographs which "bleed" over the edges are more useful through a new device. An eighth of an inch blank band across the bottom of the page allows for a caption in 6 point type, without making the words obtrusive.

"That Annual Meeting," in *News Letter*, Victorian Order of Nurses For Canada, Ottawa (Jan., 1933), gives a baker's dozen of hints for making the meeting "different" and useful. Here is one idea:

> Have a pioneer dinner, an occasion for bringing to the meeting, if possible, persons who shared in the beginnings of the organization and who have since gained distinction elsewhere. For such a dinner a supposed director of the organization in 1950 might talk about the old days of 1932 and the years which followed in a way to bring out the hopes and plans of the organization's future.

Pittsburgh's Health, Dept. of Public Health (Nov., 1932), had a "lamb and lion" cartoon on the common cold, and *Health Briefs*, Tennessee Dept. of Public Health (Nov. 15, 1932), reproduced a newspaper cartoon on "False Economy—Closing the Spigot and Opening the Bung!"

Four milk bottles on a door-step appear on the cover of *Bulletin*, State Board of Health, Louisville, Ky. (Oct., 1932). "Milk For Health." Inside several pages are given to "Louisville's Educational Milk Program."

Birmingham's Health, in its effective printed form, has been making good use of photographic covers, including an airplane view of the city, a group of laboratory utensils, and a three-dimension bar diagram of the falling death rate.

The Michigan Nurse, Lansing, has been re-born in appearance; an effective double-page spread of personality photographs.

New bulletins or house organs are reported for several health departments in California: Kern County, San Bernardino County, Fresno County, Alameda County.

Previously, monthly or bi-monthly bulletins were issued by San Joaquin, San Luis Obispo, Santa Barbara, Imperial, and Los Angeles counties; and the cities of Los Angeles, San Diego, Sacramento, San Jose, Pasadena, and Oakland.

Corrections and Amplifications—First, as to Jan., 1933, issue: "What Is Health Education?"—It should be spelled "Anette M. Phelan." "Timely Topics"—Price of single copies of *Canadian Public Health Journal* is *35 cents*.

Corrections of material in Feb., 1933, issue:

"Honorable Mention"—The New York State Department of Health report lacked a complete index because of the sickness of the capable indexer of the department.

"Reporting" . . . Single copies of the 9-page review of 1932 by Commissioner of Health Shirley W. Wynne, New York City, will be sent on request.

Health Education in Boston—Ruth I. Parsons and C. E. Turner made a study of school and out of school health education during the school year of 1931–1932. The first of a 3-part report appeared in *New England Journal of Medicine*, 8 The Fenway, Boston. Jan. 5, 1933. *25 cents*. This first part includes a more detailed review of activities, agency by agency, than ever we have seen heretofore.

The aims of this survey have been threefold:

> 1. To determine what agencies are carrying on Health Education in the city.
> 2. To determine the quantity, quality and adequacy of the work which each is doing.
> 3. To suggest ways of strengthening the present program of Health Education.

BOOKS AND REPORTS

Men Against Death—*By Paul de Kruif. New York: Harcourt, Brace,* 1932. 363 pp. Price, $3.50.

The author has given us another series of biographical sketches of those who have become famous in conquering disease and in saving life. The book opens with a prologue which is something of an essay on prolongation of life, with various philosophical ideas sketched in. In it many well known biologists and others are mentioned. He takes a dig at periodical medical examinations, though confessing that he bows to the figures of eminent actuaries who show that they prolong life.

Beyond this, the volume is divided into 4 books. The men considered in the first book seem to have been selected more or less at random. There is a reason for classing together the three found in each of the remaining books, which have appropriate titles. With the exception of Semmelweis, Shaudinn and Finsen, who have been dead for years, the author knows personally all those of whom he has written and has gotten most of his material first-hand, though he has studied the literature as well.

The selections seem well made. Those whose histories are given have not only accomplished well worthwhile things, but have dealt with diseases which are widespread and of practical daily interest to all. The book is written in the well known style of the author. He goes into considerable detail, and apparently has the power of discerning the inmost thoughts and motives of those concerning whom he writes. Whether we like this particular style or not, there is no doubt that de Kruif appeals to the public, and his books have caused many laymen to look into the sciences in which "men against death" have been laboring for so many years, oftentimes at great disadvantage, with little thought except the scientific aspects of the subject, and almost all of them on salaries wofully inadequate, especially when compared to the earnings of those in private practice of medicine, or in many lines of business.

The book is beautifully printed and illustrated, and deserves a wide circulation which we are sure it will have.

MAZŸCK P. RAVENEL

The Sanitation of Water Supplies—*By Murray P. Horwood, Ph.D. Springfield, Ill.: Thomas,* 1932. 181 pp. Price, $3.00.

This volume is intended for students in municipal sanitation and public health. It deals with engineering, laboratory and public health aspects of water supplies. The author traces the development of sanitary water supplies from their beginning to the present time. The same interesting method is used in describing the specific phases of water sanitation. The sources, uses, consumption, and the requirements of a potable supply are discussed. Other chapters deal with the relation of water to disease, the purification and improvement of water supplies, water softening, sand filtration, and disinfection. Adequate examples are given to support statements concerning problems related to the production of potable water. Errors are almost absent. On page 93, however, a reversal of the terms pH 4.0 and pH 8.0 has occurred, which might be confusing to some readers.

The book is extremely well illustrated, and its composition is of the same high type for which the publisher is well known. NEWELL R. ZIEGLER

Streptococci in Relation to Man in Health and Disease—*By Anna W. Williams, M.D. Baltimore: Williams & Wilkins,* 1932. 260 pp. Price, $5.00.

An introduction by Park emphasizes the need of a concise presentation of "the important facts and surmises connected with streptococci in health and disease." In the 220 pages comprising the monograph, Dr. Williams has crowded an orderly survey of enormous literature, the results of personal experimentation, and other information regarding streptococci (genus Streptococcus according to Bergey) which evokes admiration and promises practical use.

A plan suggestive of bacteriological textbooks is followed, with the early chapters given over to historical sketches, general classification of streptococci, and methods—properly evaluated—of cultivation and identification. Then follows generalized information as to the incidence of these organisms and their rôle in health and in local and general infections of man.

The latter half of the book is made up of chapters dealing with the relationship of streptococci to specific diseases—erysipelas, scarlet fever, septic sore throat, rheumatic conditions, and to various infections in the etiology of which a virus is more or less accepted. Photographs and tables are included, and an extensive bibliography completes the book.

It is essentially a usable book, a compact summary of practical knowledge, and the material is presented in such an easy reading style that it will serve for both immature and mature students. It should stimulate all to further studies.

The statement that the book is published by The Williams & Wilkins Company is sufficient recommendation of the quality of printing and binding.

ANNA DEAN DULANEY

The Youngest of the Family: His Care and Training—*By Joseph Garland, M.D. Cambridge: Harvard University Press,* 1932. 196 pp. Price, $2.00.

This is another book on the care and feeding of the infant and young child. It has several merits not found in a number of other manuals on this subject. In the first place the material has been brought up to date and due consideration has been given to the mental hygiene of the child as well as to its immediate physical requirements. The chapter on the Runabout Age, while short, gives a good outline of the measures which may be applied to the preschool child.

The book is written apparently for the more intelligent group of mothers. It is conveniently arranged for reference. The line drawings and half-tone illustrations are excellent.

RICHARD A. BOLT

Syllabus of Medical History—*By Victor Robinson, M.D. New York: Froben Press, Inc.,* 1933. 110 pp. Price, $1.00.

According to the definition of the term syllabus, an author presumably has a certain right to selection of topics, but when the selection is poor, one has the right to criticise. This book is said to consist of specimen questions and answers from the author's course, a specimen essay taken from a work of his, and a specimen chronology of goiter. Fifty pages are given to questions and answers, and 16 to the essay, the rest of the book being taken up almost entirely with reproductions of instruments, injuries to bone, etc.

We find that men like Loeffler, Bretonneau, and Lister are mentioned only incidentally, with no description of their accomplishments. The index does not even list diphtheria, typhoid fever, malaria, meningitis, and other important diseases, the study of which

has played a large part in the development of our present knowledge of medicine. All that we are told of anthrax is that Koch wrote a paper on its etiology. Loeffler's accomplishments are limited to the statement that he wrote with Koch on disinfection. Malaria, with its interesting and valuable history, is mentioned only in connection with the treatment of syphilis. Ross, Negri, Laveran, Budd, Gerhard, Banting, and many others who have made really great discoveries, are not even mentioned. The reviewer wonders how such a book ever came into being, and how it came to be published. A real syllabus of medical history would be extremely valuable.

It would be hard, of course, to write 60 pages without including some interesting facts, but there is so little told, even about those mentioned, and there are such flagrant omissions, that one cannot recommend the book for students or teachers, for whom the author says it is designed. Nearly two pages at the beginning of the book are given to some excellent quotations.

MAZŸCK P. RAVENEL

pH and Its Practical Applications. A New Handbook and Reference Work—*By Frank L. La Motte, William R. Kenny, and Allen B. Reed. Baltimore: Williams & Wilkins,* 1932. 262 pp. Price, $3.50.

This little volume is essentially a discoursive handbook. The first part describes the determination of pH by means of indicators, while the second part sketches the pH control practice in a number of industries. Chapters, in the latter part, are given to such subjects as water supply, water corrosion problems, disposal of sewage and industrial waste, sugar industry, gelatin and glue, leather, textiles, pulp and paper, food industries, cleaning, metal electrodeposition, soils, and microbiology. In many cases interesting charts are given showing the pH zones optimal for various steps in the process under consideration.

The first section of the book would seem a bit one-sided, as the entire explicit mention of electrometric methods of pH determination is confined to about one paragraph, even though one such method, the hydrogen electrode potential, is treated as the basic method. The excuse given for such treatment is that " all electrometric methods require considerable experience and skill on the part of the operator." Even if such be the case, which seems questionable to the reviewer, the book would not have been enlarged much, and would seem more balanced, had there been a chapter included outlining the technic and the limitations of potential measurements.

Simplicity of presentation is the avowed aim of the authors and nothing could be desired in this respect. Indeed it may well be that many, lacking adequate technical training yet finding themselves in a position where pH control is essential, will find the book valuable as a practical guide.

ALLEN E. STEARN

Bacteriology for Nurses—*By Mary Elizabeth Morse, A.B., M.D. and Martin Frobisher, Jr., S.B., Sc.D. 4th ed. Philadelphia: Saunders,* 1932. 409 pp. Price, $2.50.

This is a good book, composed of 30 chapters, 3 appendices and an index. Eleven chapters comprise the first section and are devoted to general bacteriology; the remaining 19 chapters concern special bacteriology and pathogenic protozoa.

The authors say they have practically rewritten the book to bring it up to date. Much new material on immunity, allergy, disinfectants, ultramicroscopic viruses, filterable forms of bacteria, dissociation, yeasts and molds, anaërobes and anaërobic technic, undulant fever,

and tuberculosis has been added, with illustrations. The arrangement has been made to conform with the demands of the standard curriculum.

The bulk of the book is on fundamentals, the appendices on methods. These have been reduced to the minimum to conserve space for the text proper. It is expected that an instructor will demonstrate or teach methods and the student take full notes, thus avoiding the necessity of detailed descriptions in the text. C. F. ADAMS

Bacteriology for Nurses. *With a Laboratory Manual—By Royal M. Calder, M.D. Philadelphia: Saunders,* 1932. 285 pp. Price, $2.00.

A new textbook written distinctly for nurses—" with the *nursing application* of every bit of information strongly emphasized." Bold type is freely used to call attention to various headings, especially where special care and technic is needed.

Part I consists of 12 chapters that deal with the principles and practice of bacteriology and immunology, such as methods of study, infection and resistance, transmission and disinfection, diseases transmitted through discharges of the nose, mouth and gastrointestinal tract, wound infections, prevention of blindness, food poisoning, venereal diseases, insect-borne diseases and higher bacteria, yeasts and molds.

Part II consists of 9 laboratory exercises covering general methods for the study of pathogenic organisms and the bacteriology of water and milk. Following a few useful illustrations of the handling of simple apparatus, these laboratory exercises are furnished with blank lines and circles for notes and drawings.

The appendix consists of 20 pages of miscellaneous material of apt application, some of it concerning general or fundamental matters, and some referring to specific things, all very useful.

C. F. ADAMS

The Expectant Mother's Handbook *—By Frederick C. Irving, M.D. Boston: Houghton Mifflin,* 1932. 203 pp. Price, $1.75.

This compact little handbook from the pen of an experienced obstetrician is well written, full of common sense, and attractively arranged. It explains clearly and without verbosity the anatomical, physiological, and hygienic aspects of pregnancy; touches on some of its dangers and complications; and gives what the patient wants to know about labor and the lying-in period. A rather unusual feature of the book is a chapter on the biological aspects of pregnancy.

This can hardly be said to be a simple enough book for all prospective mothers but the intelligent and well informed woman will find here everything she needs to supplement what she gets from her family physician.

MERRILL E. CHAMPION

Applied Bacteriology—*By Thurman B. Rice, A.M., M.D. New York: Macmillan,* 1932. Price, $2.50.

The title of this book is misleading, as it is intended for nurses. The author disapproves of all existing texts on bacteriology for nurses on the ground that they are merely medical books " written down."

We regard this volume as excellent for its announced purpose. It contains a large number of illustrations, some good and instructive, and some poor. It is stated that they are " overdrawn " for the purposes of presenting a clear picture. The text is readable, and as far as we have been able to detect, accurate. We approve of the announced object of avoiding theory and stressing points necessary for diagnosis, the collection of specimens, and nursing treatment. As is well known to many of our readers, the author has a distinctly original and practical way of presenting his material, which is carried out in this latest work.

We can recommend it, but believe that nurses should have, in addition to lectures and a good textbook, practical laboratory experience, though the preface does not indicate that this is a text to accompany such practical training. The make-up and printing of the book are excellent. MAZŸCK P. RAVENEL

Publications of the National Quarantine Service, Republic of China—Series I—*By Dr. Wu Lien-Teh.*

This publication reviews the cholera situation in China, giving a very complete history of this disease in Shanghai, starting from the year 1820, when the modern history of cholera in China is considered to begin, up to and including the year 1929, and more especially portrays the great improvement in the cholera situation since the establishment of the National Quarantine Service on July 1, 1930.

For many years the problem of cholera in Shanghai has been an acute one but coöperation of the three health authorities in Shanghai (International Settlement, French Concession, and Greater Shanghai) was not achieved for the common purpose of combating this disease and improving health conditions in the community.

The establishment of the Ministry of Health in Nanking in 1928 was followed by the adoption of a new progressive policy, and in 1930 there was created a Central Cholera Bureau where the efforts of the three health authorities could be coördinated, all under the general direction of the National Quarantine Service, of which Dr. Wu Lien-Teh is Director. A program of anti-cholera vaccination was mapped out and an intensive epidemiological study of local cholera foci was undertaken, including examinations for carriers, possibility of water infection, etc.

When in the summer of 1930 an outbreak of cholera occurred, the authorities were united and prepared to fight it, with the result that only 128 cases were recorded with 16 deaths. When compared with previous outbreaks of cholera in Shanghai, the 1930 outbreak showed not only a decided reduction in the number of cases and deaths but the onset of the epidemic occurred later than in many of the previous years. From May to September 537,034 anti-cholera vaccinations were performed. There is little doubt but that the strenuous anti-cholera campaign conducted earlier in that year contributed not a little to this satisfactory result. During the outbreak laboratory research was carried on regarding the recognition, viability, agglutination, etc., of the cholera and related organisms, the results of which are summarized.

The publication also includes an extensive report of a survey of the needs for establishment of adequate quarantine service for the port of Shanghai made by Dr. C. L. Park of Melbourne, Australia, Chief of the Epidemiological Division of the Health Section of the League of Nations, and Director of the Australian Quarantine Service.

F. A. CARMELIA

Medical Care for the American People—*The Final Report of the Committee on the Costs of Medical Care. Chicago: University of Chicago Press,* 1932. Price, $1.50.

This volume is the result of 5 years of work and the expenditure of something like a million dollars contributed by a number of foundations. Assistance in the shape of supplementary studies has been given by a number of scientific organizations, and credit is given to state and local departments of health and other organizations for coöperation in field work. In addition to this final report, some 26 studies have been already published. The committee believes that a number of questions have been raised which need further

attention, and for several of them, outlines of studies have been made.

The report is divided into two chief parts; the majority and minority recommendations. In addition to the principal minority report, there is a second, by two dentists, and the volume is closed by two personal statements by members of the committee, one of which contains much food for thought, and the last, a statement that the recommendations do not deal adequately with the fundamental economical question, to study and consider which, the committee was primarily formed.

The majority report recommends that medical service, both preventive and therapeutic, "should be furnished largely by organized groups of physicians, dentists, nurses, pharmacists, and other associated personnel," and that these should be organized around hospitals. High standards are insisted on. It further recommends "the extension of all basic public health services," so that they will be available to the entire population, according to its needs. This requires greater financial support for health departments and full-time trained health officers and staffs. ". . . The costs of medical care should be placed on the group payment basis through insurance, taxation, or both methods," but medical services on the individual fee basis may be continued for those who prefer it. The committee recommends also that the "study, evaluation, and coördination of medical service be considered important functions for every state and local community," and that "the coördination of rural with urban services should receive special attention." The last recommendation deals chiefly with the training of physicians, dentists, pharmacists, nurses, nurse-midwives, etc.

The principal minority report recommends that "government competition in the practice of medicine be discontinued and that its activities be restricted (a) to the care of the indigent and of those patients with diseases which can be cared for only in governmental institutions; (b) to the promotion of public health; (c) to the support of the medical departments of the Army and Navy, Coast and Geodetic Survey, and other government services which cannot because of their nature or location be served by the general medical profession; and (d) to the care of veterans suffering from bona fide service-connected disabilities and diseases, except in the case of tuberculosis and nervous and mental disease." The minority believes that government care should be extended to indigents in order to relieve the medical profession of the burden it now carries in this respect. It agrees with the majority in believing that "the study, evaluation, coördination of medical service be considered important functions for every state and local community." It recommends that "united attempts be made to restore the general practitioner to the central place in medical practice." It opposes vigorously the "corporate practice of medicine, financed through intermediary agencies," regarding it as being economically wasteful, unfair to the medical profession, and inimical to continued high standards. It believes that methods which can be fitted into present institutions and agencies without interfering with the fundamentals of medical practice be tried, and ends by recommending the development by state or county medical societies of plans for medical care.

From this abstract of the two chief reports, it will be seen that while there is agreement on some points, there is absolute disagreement on important fundamentals.

We recognize the inadequacy of this review, but the report itself is so succinct, and covers so many points, that a detailed review is impossible. The committee has been thorough in its

work and has considered almost every point that might be raised. Everyone recognizes that economic conditions have brought about a change in the relationship between the doctor and the people. Group practice has probably come to stay. Expenses have mounted so that it has been said only two classes of people in America get proper medical care—the poor and the rich.

The American Public Health Association is not primarily interested in the practice of medicine, although it is generally recognized by the members that efficient medical care plays a great part in promoting public health, by the early detection of cases, proper isolation, and the destruction of foci of infection. That it recognies the difficulties of the present situation is proved by the many studies which have been carried on through grants for some years, but so far, it has not officially committed itself to one or the other of the reports of this committee. Until such a time, we can only commend the report to the careful consideration of those who are interested in adequate medical care and the many problems which are involved in extending it to all. The majority report as well as the several minority ones present questions which may well be considered by every thoughtful individual.

MAZŸCK P. RAVENEL

Fads and Quackery in Healing—*By Morris Fishbein, M.D. New York: Covici-Friede,* 1932. 384 pp. Price, $3.50.

The craft of healing always has been a reasonably honorable one. Long before medicine emerged as a science, however, it was invaded by a host of mountebanks and imposters. Today it is infested with quacks and charlatans, with fakirs and faddists, mostly on the fringes of regular medicine, but not entirely so, for it is rumored that not all the shysters and incompetents are outside of the profession.

To this ilk the militant editor of the *Journal of the American Medical Association* and of *Hygeia* pays his respects with much gusto, and exposes to ridicule with his pungent pen the actual or alleged foibles of homeopathy, eclecticism, osteopathy, chiropractic, Christian Science, physical culture, and the various offshoots, imitations, and modifications of these dubious benefactors of mankind.

Other topics dealt with in a vigorous and frequently vitriolic manner are the methods of the late Albert Abrams, the antivivisectionists, the less ethical beauty culturists, and the more deluded of the psychoanalysts. Rejuvenation, birth control, food fads, physical therapy of the coarser sort, medical errors in newspapers, and medical advertising also come in for some scathing comments.

One anomalous chapter is devoted to fads in health legislation. This material, reprinted from a magazine article of some years ago and bolstered with diatribes on the federal maternity and infancy law and the care of veterans, is the weakest part of the book, so weak, in fact, that it totters. A final chapter on the choice of a physician consists mainly of a catalogue of the *Principles of Medical Ethics*. If this chapter had been omitted, not much would have been lost, especially since the highly diverting chapters on the various quacks emphasize clearly enough that abstinence from these forms of healing is wise. The pecuniary emoluments accruing to some of these imposters are, however, so attractively set forth that some readers may be inspired to go into such lucrative business.

This book is entertaining and instructive. It is well printed and deserves wide perusal. The layman could benefit much from the information contained in it, but it is doubtful if even such a persuasive volume as this will have any permanent effect in reducing

medical quackery. The privilege of being duped is one of the indefeasible rights of the American people.

JAMES A. TOBEY

History of Chinese Medicine—*By K. Chimin Wong, Licentiate of Medicine and Surgery, Hongkong, Formerly Lecturer on Medical History, National Central University, etc., and Wu Lien-Teh, M.A., M.D., Dr.M.Sc., Director and Chief Medical Officer, Manchurian Plague Prevention Service; Director, National Quarantine Service, etc. Tientsin, China: The Tientsin Press, Ltd.*, 1932. Price, $7.50.

This monumental work was conceived of more than 15 years ago, and the actual writing has consumed some 10 years. One can readily understand this even by a glance through its pages.

The volume is divided into 2 books. The first, written by Dr. K. Chimin Wong, covers (1) The Ancient or Legendary Period, 2697–1122 B.C., (2) The Historical or Golden Period, 1121 B.C.–960 A.D., and (3) The Mediaeval or Controversial Period, 961–1800 A.D. The second book, running from 1801 to 1832, which takes up a little more than three-fourths of the volume, was written by Dr. Wu Lien-Teh, whose industry in connection with the Manchurian Plague Prevention Service, the National Quarantine Service, and other notable endeavors is well known.

The authors recognize that in the early period there were countless myths and legends recorded which are of interest chiefly to students of mythology. Later, these stories became more authentic, and the historical period gradually developed, which covered nearly 2000 years, extending over 3 dynasties. Medicine was practically dominated by philosophical teachers. The Han dynasty (B.C. 206–A.D. 220) of this period is memorable because of the fact that during it, 3 of the greatest physicians produced by China lived, and is considered the most glorious period of Chinese medical history. These men laid stress on direct observation and placed medicine on a more scientific basis. From the 11th to the 17th centuries, there came a marked change in medical thought, which gradually developed into 4 schools. There were constant attacks both on the old and the new. Specialism was noticeable, and many important monographs were produced. The most notable feature of this epoch was the struggle between the old and the new forces, but the latter steadily gained ground. While there was a great deal of mysticism and superstition, many observations were made in anatomy, physiology, and therapeutics. Indeed, it seems that the Chinese discovered, in part at least, the circulation of the blood 2000 years before Harvey. The Nei Ching says: "All the blood is under the control of the heart." "The heart regulates all the blood in the body." "The blood current flows in a continuous circle and never stops." There was no distinction made between the arteries and the veins. The systemic and the pulmonary circulation were not differentiated, and weird functions were attributed to various organs.

During the T'ang dynasty (619–907 A.D.) Buddhism came into China, and with it, ideas of Indian medicine. Also the Taoist became active and a system of charms for the cure of disease was invented. The author of Book One designates the Chou dynasty as the "age of philosophy, the Han dynasty the age of science, the T'ang dynasty the age of superstition."

Book Two gives a short discussion of conditions prior to 1600 A.D., and describes the early contacts between China and western medicine, the influence of Buddhism, and finally the arrival of a foreign medical man in 738 A.D. The

author tells us that there were European physicians on the staff of the Mongol conquerors, describes the activities of the Nestorian Christians, the first Catholic missionaries, and the early Portuguese hospitals at Macao. It was during the reign of Wu Ti (B.C. 140–87) that the Chinese Empire extended its domain westward and brought about the early Euro-Asiatic contacts. This ruler was considered the greatest of the Han sovereigns. Knowledge of this period is due largely to the great historian of the Han dynasty, Szu-ma Ch'ien (B.C. 145–74). The author gives full credit to European medicine and to missionaries, among the first whom were the Roman Catholics (1294 A.D.) and attributes the developments in the 17th and 18th centuries largely to their influence. While they were not trained medical men, they had opportunities to demonstrate the value of western medicine, and introduced quinine. Western medicine was more firmly implanted by the surgeons of the East India Company and the first Protestant medical missionaries about 1820. For 50 years after, there was much effort by individuals, among whom Dr. Wu names Alexander Pearson, Senior Surgeon of the East India Company, who introduced vaccine against smallpox, T. R. Colledge, President of the Chinese Medical Missionary Society, Peter Parker, W. Lockhart, J. C. Hepburn, J. L. Maxwell, and Patrick Manson.

The modern conception of public health, as understood today, had its beginning after the outbreak of pneumonic plague in 1910, which swept Manchuria and cost 60,000 lives. American doctors played an important part during this epidemic.

It may be said that Book Two is largely a history of the missionaries, religious and medical, who have served in China, and the author is generous in the credit and praise he gives to them.

In 1911 came the beginnings of modern public health work under Chinese physicians, who since that time have maintained their leadership, many of them having been educated in Europe and America. A number of women have taken prominent parts in the new developments. There are many other interesting features which we would like to comment upon in some detail, such as the 2 outbreaks of plague in Canton and Hongkong, and Manchuria. In 1912, the Manchurian Plague Prevention Service under the direction of Dr. Wu Lien-Teh was established. A detailed account is given of the foundation of medical schools, described as "proper union medical schools," and the systematic training of nurses. The founding of the China Medical Board and its acquisition of the Union Medical College in Peking in 1915, was a most important step. Coincident with advances came the founding of Chinese medical journals, a list of which is given. Many standard books were translated into Chinese and published.

There are lists of persons, a summary of dynasties, geographical names in Chinese, with their English equivalents, chronological tables, and finally an excellent index. The volume is profusely and well illustrated, while charts, such as Figure I, which illustrate the chief sources of Chinese medicine, are of great help to the foreign reader.

One cannot but speak with the greatest admiration of the thoroughness with which the work has been done and the enormous amount of labor expended. Dr. Wu Lien-Teh believes that a new spirit has arisen in China among all classes which has brought about changes of relationship between the foreigners and the Chinese, so that missionary colleges, hospitals, etc., are ready to adjust themselves to Chinese views and to elect Chinese as presidents and directors, as well as to make many

Chinese appointments. China is ready to discard many of its old ways, to receive and adopt western ideas and new ways of living.

The English used by both authors is excellent, and we only wish that American writers could be as explicit and succinct as these learned foreigners have shown themselves to be. The printing and make-up are excellent. Altogether, the book is most useful and interesting, opening up to us the history of this great Empire, in which civilization flourished long before most of our western countries came into organized existence.

MAZŸCK P. RAVENEL

The Curative Value of Light—*By Edgar Mayer, M.D. New York: Appleton,* 1932. 175 pp. Price, $1.50.

In the January 16 number of *The Journal of the American Medical Association,* Dr. Mayer presented an article on the present status of light therapy which has been of great value to students of this form of therapeutics.

With the development of sun lamps, ultra-violet transmitting glasses, and the general urge from the sales viewpoint to greater purchase of these means for producing artificial sunlight, there has arisen in the lay-mind many problems.

Many of these problems are now resolved for the layman in this new book of Dr. Mayer's. In it he tells simply and clearly the things that the layman wants to know about what the elements do, what sort of disease conditions may be prevented by ultra-violet treatment, how much of the body should be exposed during sun bathing, how to use the lamp with children, etc. Answers to all of these questions are to be found in this new and valuable contribution to public health; and not the least of its values is advice as to how to avoid over-dosage and ill-treatment.

The language is simple and clear and the book full of the things we all wish to know.

W. H. EDDY

Teaching Nutrition to Boys and Girls—*By Mary Swartz Rose. New York: Macmillan,* 1932. 198 pp. Price, $2.00.

That proper diet selection will prevent ill health—is today accepted science. But how to make individuals practice such food selection?

Mrs. Rose, in her *Feeding the Family,* and *Foundations of Nutrition,* has already established her position as a successful organizer of what should be known and done in making food selection an aid to health. But in those books she addressed an adult audience.

In the present book she has evidenced an appreciation that if children can be made to realize what food does for them and to seek voluntarily those foods which produce bodily vigor and happiness, adult problems will be much simplified. It seems to me that her text not only shows realization of the advantages of beginning early with nutritional training, but also shows skill in making children learn by doing. Tests which she described would make the acquisition of essential facts about foods not only painless but enjoyable to the average child.

The form of the material presented also adapts itself readily to any elementary school curriculum, as the test described can be made a part of the child's general science experimentation and does not represent another course of study to be fitted into a crowded curriculum.

It seems to me that the book should be strongly recommended to the attention of all elementary and high school teachers.

W. H. EDDY

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

Venereal Disease Control the Country Over—What official and voluntary agencies attempted during 1932 is recounted state by state. The outstanding conditions seem to be: heavy clinical burdens, reduction in support, and determination in face of discouragement.

ANON. With the States and Communities in 1932. J. Soc. Hyg. 19, 2:52 (Feb.), 1933.

Toxin vs. Virus—The findings of a report of interesting research include: diphtheria toxin added to vaccine virus exerts a deterrent action upon "take" and systemic response in rabbits; the action of the toxin is neutralized by antitoxin; and the site of a positive Schick test is insusceptible to vaccine virus for three weeks.

ARMSTRONG, C. Modification of the Vaccine Response in Rabbits by the Application of Diphtheria Toxin to the Vaccination Site. Pub. Health Rep. 48, 1:1 (Jan. 6), 1933.

When Babies Refuse the Quart a Day—Two delicious excerpts from this delightful paper: "There is too much competition in weight-gaining during infancy and childhood, and this one fact gives the child the whip hand throughout its young life. It does not take a child long to sense that fat babies and thin mammas are the style." And, "Meal time should be a happy, quiet time. A mad cabaret with one or more of the family acting as whirling dervishes has no place at the child's meal time."

ARNOLD, D. P. Why a Child Refuses to Eat. New York State J. Med. 33, 1:20 (Jan. 1), 1933.

Do Public Dumps Menace Health?—This British sanitarian views with alarm "tipping" (euphoneous synonym for our "dumping") because cloths used by syphilitics might lie in the dumps. "I cannot imagine," he shivers, "any more unjustifiable risk than is contained in this particular alone to public health." This seems to us to be the height of something-or-other.

BALDWIN, H. B. C. Disposal of House Refuse. J. Roy. San. Inst. 53, 7:359 (Jan.), 1933.

Limitations of Health Yardsticks—Graphs depicting the decline in general and particular death rates are included in this paper which confesses the decided limitations of the general statistical measures of the public health.

BRITTEN, R. H. Trends of Health in the United States. Pub. Health Rep. 48, 2:27 (Jan. 13), 1933.

Our Public Enemies—First come the quacks, says this author, the Christian Science healer, the chiropractors and naturopaths; then the anti-vaccinationists, but the greatest menace of all are the anti-vivisectionists. This is an excellent paper, though the author neglects to pay his compliments to the fundamentalists who insist that the youth of our land be taught science a la revelation.

CANNON, W. B. Enemies of Society. Sci. Monthly, Feb., 1933, p. 150.

Voice Crying in Wilderness—These are serious conclusions: hospitalization of maternity cases increases, but puerperal mortality does not decrease; meddlesome midwifery and puerperal infections seem to be the major causes; something is wrong with maternity wards in general hospitals; architectural and administrative isolation is needed.

DELEE, J. B. and SIEDENTOPF, H. The Maternity Ward and the General Hospital. J.A.M.A. 100, 1:6 (Jan. 7), 1933.

When Colons Disfunction—Glib "health educators" who broadcast cure-all diets for preventing constipation would do well to ponder over this meaty discussion of the disfunctioning colon.

JORDON, SARA M. The Unstable Colon and Neurosis. J.A.M.A. 99, 27:2234 (Dec. 31), 1932.

New Angles of Venereal Disease Prevention—Venereal disease control problems as viewed today suggest only minor changes in program emphasis to meet modern conditions. The recommendations of this able paper are: treatment facilities at high efficiency level to meet increased demand; community measures to meet the needs of the new nomads; recognition of effect of poverty on the family.

KEYES, E. L. The Present Status of Venereal Disease Prophylaxis—Social and Medical. J. Soc. Hyg. 19, 1:1 (Jan.), 1933.

Is There a Polio Susceptible Body?—Fifty-two little poliomyelitis patients were compared with controls in respect to physical characteristics. No evidence of a direct relation of certain characteristics to susceptibility to poliomyelitis was discovered. Draper's findings were not confirmed.

LEVINE, M. I., *et al.* Relation of Physical Characteristics to Susceptibility to Anterior Poliomyelitis. J.A.M.A. 100, 3:160 (Jan. 21), 1933.

Knocking Some Props From Under Contraception Statistics—Women who have been delivered in eastern hospitals are being asked by their medical attendants about their contraceptive practices. Of the white women, 36 per cent use some means, a smaller proportion than is commonly assumed. Later reports will give more detailed findings, but there is much food for speculation here. For instance, this finding: with contraception as actually practiced, there was a reduction in the pregnancy rate under 20 per cent below that which obtained in the group not resorting to this procedure—not a high degree of effectiveness.

PEARL, R. Preliminary Notes on a Coöperative Investigation of Family Limitation. Milbank Quart. Bull. 11, 1:37 (Jan.), 1933.

Catching Bedbugs in Molasses—Health workers who meet the bedbug problem in all its ugliness will want to know the latest wrinkles. This British genius has invented a "trench trap" which is placed all around the infested room. The trench is filled with treacle in which the bugs proceed to drown themselves.

MILLARD, C. K. Presidential Address on an Unsavory But Important Feature of the Slum Problem. J. Roy. San. Inst. 53, 7:365 (Jan.), 1933.

Debunking Posture—"But posture is said to be related to health, to mentality, and to morality. This being the case, it is somewhat confusing to find very delicate and stupid and immoral subjects at the A end of posture distribution, and very vigorous, bright, and honorable children at the D side.

"Even if mentality and morality and health *did* depend on carriage and they are subject to change from what is called poor to better posture, they must relapse with it when the spine returns to its usual curvature, as it apparently always does."

ROGERS, J. F. The Long and the Short of the Carriage Business. Health and Phys. Ed. 3, 10:11 (Dec.), 1932.

Poliomyelitis Streptococcus and Convalescent Serum—It must be trying to the pundits, who assert that Rosenow's poliomyelitis streptococcus just doesn't exist, to have it continue as the subject of researches, all of which seem to indicate that the condemned microörganism is very much alive. This paper reports the effect of convalescent serum upon the streptococcus.

ROSENOW, E. C. A Specific Reaction of Convalescent Serum on the Streptococcus Isolated in Studies of Poliomyelitis. J. Immunol. 33, 6:455 (Dec.), 1932.

Who Teaches Health in Boston?—The many agencies doing health education in the City of Boston are reported upon. Their very number and diversity of interests are eloquent of the need for some coördinating organization. A lesson here for all.

PARSONS, R. I. and TURNER, C. E. Health Education in the City of Boston. New Eng. J. Med. 208, 1:19 (Jan. 5), 1933.

Almoners in British Hospitals—Almoner, it seems, is the name hit upon by our British cousins to designate the job of hospital social worker. The chief difference from our h.s.w.'s seems to be that appointee must be a "'lady' as understood in its old-fashioned sense."

TELLING, W. H. M. The Rôle of Hospital Almoners in the Maintenance of Health and the Avoidance of Disease. J. State Med. 41, 1:21 (Jan.), 1933.

The Doctor Looks at Statistics—Of about 1,400 cases in Baltimore families in this study, nine-tenths exhibited coryza, two-thirds had cough, nearly half had sore throat, about a fourth were in bed. Three colds per year per person was the mean.

VAN VOLKENBURGH, V. A. and FROST, W. H. Acute Minor Respiratory Diseases Prevailing in a Group of Families Residing in Baltimore (Md.), 1928–1930. Prevalence, Distribution, and Clinical Description of Observed Cases. Am. J. Hyg. 17, 1:122 (Jan.), 1933.

Experience With Whooping Cough Vaccine—Of 300 children immunized with pertussis vaccine, 8 were certainly exposed and 127 probably exposed to whooping cough infection. None contracted the disease. The authors warn against stock vaccines.

SAUER, L. Whooping Cough. J.A.M.A. 100, 4:239 (Jan. 28), 1933.

And Still We Die From Appendicitis—"If appendicitis is increasing, as is possibly the case, why is not a share of the solution of the problem one of preventive medicine?" The answer to this purely rhetorical question is that the public must somehow learn that delay and improper medication, especially catharsis, invite mortality. Incidentally, most physicians also have something to learn about appendectomy.

WALKER, I. J. A Comparative Mortality Study of Acute Appendicitis. New Eng. J. Med. 208, 3:113 (Jan. 19), 1933.

BOOKS RECEIVED

HOW TO BUDGET HEALTH. Guilds for Doctors and Patients. By Evans Clark. New York: Harper, 1933. 328 pp. Price, $4.00.

A GENERAL HISTORY OF NURSING. By Lucy Ridgely Seymer. New York: Macmillan, 1933. 317 pp. Price, $2.75.

YOUR TEETH. THEIR CARE AND PRESERVATION. By Lewis H. Urling. Philadelphia: Dorrance, 1932. 67 pp. Price, $1.50.

A DECADE OF DISTRICT HEALTH CENTER PIONEERING. Ten Year Report of the East Harlem Health Center. New York, 1932. 148 pp. Price, $1.00.

INFANTS AND CHILDREN. THEIR FEEDING AND GROWTH. By Frederic H. Bartlett. Farrar & Rinehart, 1932. 409 pp. Price, $1.50.

FOOD IN HEALTH AND DISEASE. Preparation, Physiological Action and Therapeutic Value. By Katherine Mitchell Thoma. Philadelphia: Davis, 1933. 368 pp. Price, $2.75.

PROCEDURES IN TUBERCULOSIS CONTROL. For the Dispensary, Home and Sanatorium. By Benjamin Goldberg. Philadelphia: Davis, 1933. 373 pp. Price, $4.00.

A HEALTH INSTRUCTION GUIDE FOR ELEMENTARY SCHOOL TEACHERS. By Jeanie M. Pinckney. Austin, Texas: University of Texas, 1932. 368 pp. Price, $1.00.

THE ADOLESCENT BOY. By Winifred V. Richmond. New York: Farrar & Rinehart, 1933. 233 pp. Price, $2.50.

CRIMES AND CRIMINALS. By William A. White. New York: Farrar & Rinehart, 1933. 276 pp. Price, $2.50.

26TH ANNUAL REPORT OF THE SECRETARY. National Canners Association. 36 pp. Copies free to members of the A.P.H.A. by applying to the company, 1739 H Street, Washington, D. C.

NEWS FROM THE FIELD

"THE LAWYER AND HIS PUBLIC"

A SERIES of radio broadcasts is being offered under the joint auspices of the American Bar Association and the National Advisory Council on Radio in Education. The general subject of the series will be "The Lawyer and the Public," non-technical in nature, and will include 15 broadcasts given by leading members of the legal profession. The broadcasts will be 15 consecutive Sunday evenings, 6:00 to 6:30 Eastern Standard Time, and will be given over a nation-wide network of the Columbia Broadcasting System.

YELLOW FEVER VOLUNTEER DIES

THE death of Paul Hamann, of East Moline, Ill., one of the volunteers in the yellow fever experiment in Cuba in 1900–1902, has been reported. He died of broncho-pneumonia following influenza after an illness of one week. Mr. Hamann was one of the 15 living volunteers who received gold medals and pensions of $125 per month authorized by Congress in 1929. The medals were presented in 1931.

PRIZE FOR ESSAY ON GOITER

THE American Association for the Study of Goiter again offers $300 as a first award and 2 honorable mentions for the three best essays based on original research work on any phase of goiter, to be presented at its annual meeting in Memphis, Tenn., May 15–17. Competing manuscripts must be in English and submitted to Dr. Julius R. Yung, 670 Cherry Street, Terre Haute, Ind., not later than April 1. Manuscripts arriving after this date will be held for the next year or returned on request.

HEART COMMITTEE MEETING

A SCIENTIFIC meeting of the Committee on Cardiac Clinics of the Heart Committee of the New York Tuberculosis and Health Association was held on February 28 at the New York Academy of Medicine. Papers read included one by Dr. Eugene M. Landis, and one by Dr. J. Murray Steele, and discussions by Dr. J. Hamilton Crawford and Dr. Alfred E. Cohn.

NATIONAL BOYS' WEEK

A MANUAL of suggestions for the preparation of a complete program for each day of Boys' Week—April 29 to May 6—is in preparation. The Committee will be glad to mail, gratis, copies of this manual directly to any unit of your organization which requests them.—National Boys' Week Committee, 211 West Wacker Drive, Chicago, Ill.

A.N.A. DELEGATES TO CONGRESS

THE official delegates from the American Nurses' Association to the Congress of the International Council of Nurses in Paris and Brussels next July were named at the January board meetings. They are Elnora E. Thomson, Susan C. Francis, Adda Eldredge and Katharine Tucker. Some 25 persons from the United States are on the program either for papers or for discussions. Miss Thomson, Miss Geister, Miss Roberts, and Miss Eldredge are among those invited to read papers.

OHIO STATE HEALTH DEPARTMENT

REORGANIZATION of the Ohio State Health Department into 6 divisions instead of 9 was announced

in December, 1932, by Dr. Harry G. Southard, Ohio State Health Officer, Member A.P.H.A. Dr. Emery R. Hayhurst, of Columbus, F.A.P.H.A., formerly consultant in the division of industrial hygiene, has been appointed chief of that division. Dr. Elgie R. Shaffer, F.A.P.H.A., was appointed chief of the child hygiene division. Dr. Reaves W. DeCrow, of Portsmouth, member A.P.H.A., succeeds Dr. Shaffer as head of the bureau of local health organization.

PERSONALS

MARY AUGUSTA CLARK, F.A.P.H.A., is now Research Associate in the Division on Community Clinics of the National Committee for Mental Hygiene. In this position, Miss Clark is continuing a consultant service with reference to statistical records and reports in child guidance and adult psychiatric clinics which she has given for the past 7 years as a member of the Commonwealth Fund.

JANET M. GEISTER, R.N., director at headquarters of the American Nurses' Association, resigned January 30, the resignation to go into effect March 15. Mrs. Alma Scott, the associate director, will carry on the director's duties for the present.

MRS. MARIE F. KIRWAN, of the State Charities Aid Association of New York, is now chairman of the Department of Public Welfare, New York State Federation of Women's Clubs. This includes all forms of health activities covered by the clubs.

DR. FRANK JOSEPH JIRKA, of Chicago, was appointed Illinois State Health Director on January 25. During the 40 years of its existence, 5 different physicians filled the office of chief executive for one full term or more. Dr. Jirka succeeds Dr. Andy Hall, of Springfield, member A.P.H.A., who resigned.

DEATHS

CHARLES BUCKLEY MAITS, M.D., F.A.P.H.A., Director of the Department of Public Health of Pittsburgh, Pa., died early in January. Dr. Maits was active in the Air Pollution Investigation, which has been carried on for years by the Mellon Institute of Industrial Research.

DR. H. K. READ, F.A.P.H.A., of Houston, Tex., died in December, 1932. He was the supervisor of hygienics for the Houston public schools for the last six years.

CONFERENCES

March 21–25, Fourth Pan-American Medical Congress, Dallas, Tex.

April, American Physiological Society, Cincinnati, Ohio.

April 3–8, New York Food and Health Exposition, Grand Central Palace, New York, N. Y.

April 4–6, American Water Works Association, Southeastern Section, Albany, Ga.

April 29–May 6, National Boys' Week.

May 29–31, Western Branch, A.P.H.A., Pasadena, Calif.

June, State and Provincial Health Authorities of North America, Washington, D. C.

June, State and Territorial Health Officers Conference, Washington, D. C.

June 11–17, National Conference of Social Work, Detroit, Mich.

June 12–17, American Medical Association, Milwaukee, Wis.

June 26–30, National Tuberculosis Association, Toronto, Canada.

June 26–30, Annual Meeting of the American Home Economics Association, Milwaukee, Wis.

June 27–July 1, Convention of the Association for Childhood Education, Denver, Colo.

July 1–7, National Education Association, Chicago.

July 5–9, International Union of the Protection of Childhood, Paris.

July 10–15, International Council of Nurses, Paris, July 10–12; Brussels, July 13–15.

July 18–20, International Congress of Pediatrics, London.

July 25–29, British Medical Association, Dublin.

July 29–August 4, World Federation of Education Associations, Dublin.

MEDICAL BUREAU

The Medical Bureau has available class A physicians, dentists, graduate nurses and laboratory workers who have specialized in public health work. All credentials have been thoroughly investigated. Those in need of such personnel may receive complete biographies including statements regarding candidates' ability, integrity, and responsibility. No charge to employers for the introduction of applicants. M. Burneice Larson, Director, The Medical Bureau, Pittsfield Building, Chicago.

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« Announcement »

. . . Beginning January 1, 1933, THE AMERICAN JOURNAL OF CANCER will be published every month instead of every two months as last year. Its popularity and the increased amount of authoritative articles have forced this more frequent publication.

. . . There will be three volumes this year « » one for each four months. The subscription rate is $3.50 per volume or $9.00 for one year covering three volumes (rates for Canada and foreign countries given on request).

. . . A complimentary sample copy will be gladly sent you for your examination.

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